TECHNOLOGY DEPT.

# ROADS AND STREETS

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*Fleet of LeTourneau Carryall Scrapers equipped with Timken Bearings working on a Washington State highway relocating job, involving the removal of 1,154,000 yards of sand.*

Severe competitive conditions may follow the winning of the war. The race will go to the swift—the profits to the prudent. Progressive equipment manufacturers will enable you to hold your own when the time comes.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

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TAPERED ROLLER BEARINGS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

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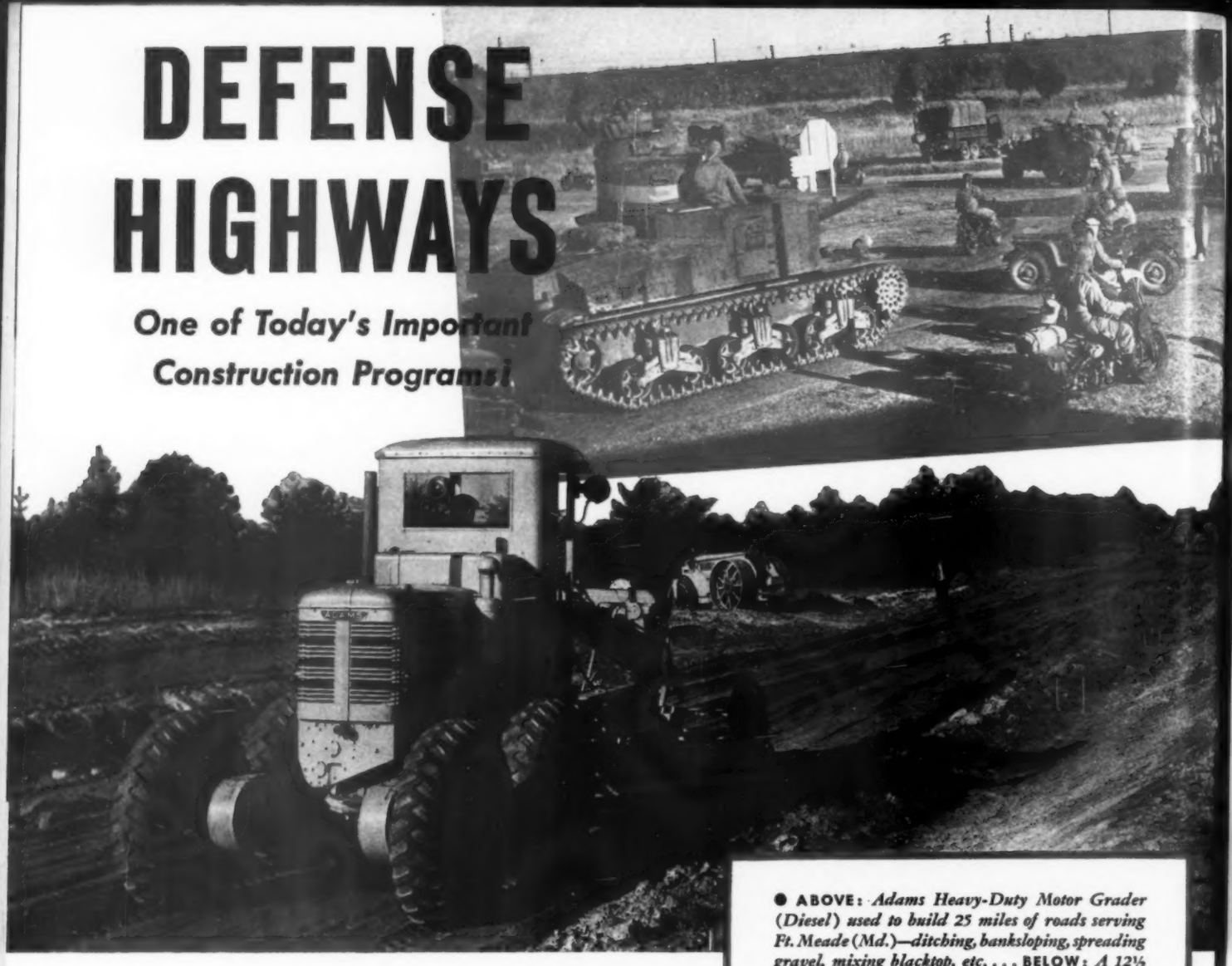

● **ABOVE:** *Adams Heavy-Duty Motor Grader (Diesel) used to build 25 miles of roads serving Ft. Meade (Md.)—ditching, banksloping, spreading gravel, mixing blacktop, etc. . . .* **BELOW:** *A 12½ yd. Adams Hauling Scraper building bridge approach on access road to Ft. Leonard Wood (Mo.).*

HUNDREDS of defense projects have sprung up during the past year which are not yet served by adequate roads. Completion of the government's $150,000,000 access road program is a "high-priority" task in which you may have a part. Adams equipment—with its wide range of application, its ease of operation and dependable performance—is "tailor-made" to handle such jobs with economy and dispatch. Put it on your payroll. ★ ★ ★ For some months much of Adams production has been absorbed in the national defense effort. We regret, sincerely, any delays which may be experienced in delivering "non-defense" orders and beg the indulgence of those affected for the good of the common cause.

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*Sales and Service throughout the World*

**USE THESE ADAMS MACHINES**—Motor Graders in six models, Leaning Wheel Graders, Elevating Graders, Hauling Scrapers, Tamping Rollers, etc.

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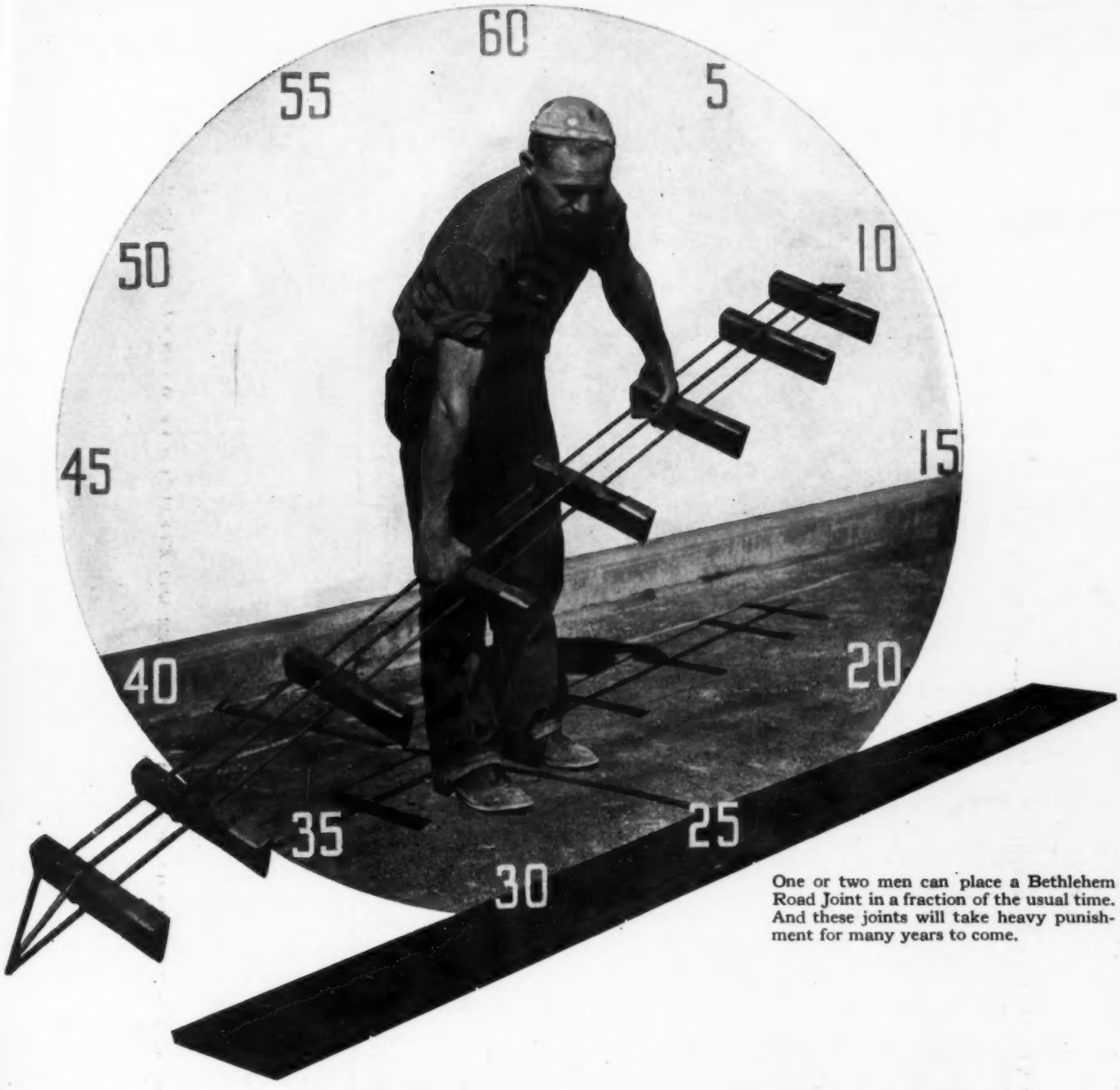
# ADAMS

## ROAD-BUILDING AND EARTH-MOVING EQUIPMENT




One or two men can place a Bethlehem Road Joint in a fraction of the usual time. And these joints will take heavy punishment for many years to come.

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Offhand, saving a minute placing each road joint doesn't sound like much. But add those minutes up. Over even a mile of new road, you'll find that you can save several hours' time.

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**BETHLEHEM STEEL COMPANY**

BETHLEHEM STEEL

# ROADS AND STREETS

**Vol. 85, No. 2 ▾ February, 1942**

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**ROADS AND STREETS**

CCA

*A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; and to the construction and maintenance of airports.*

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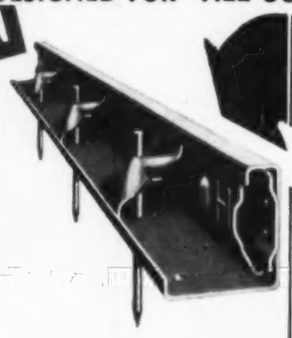

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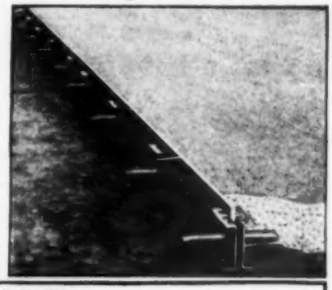
*RIGHT: HEL-CO ARMOR-DOWELS in TYPICAL TRANSVERSE JOINT . . .*



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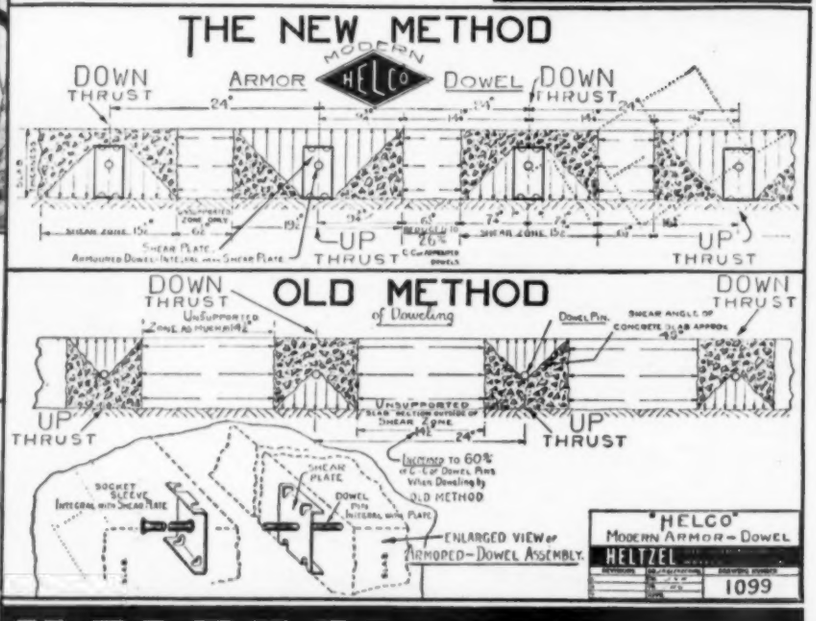


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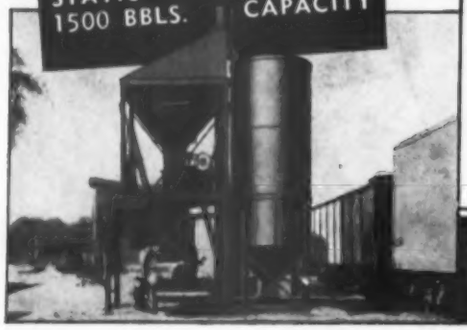

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**190 ft. per hour—25 ft. width—Average for job.**

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Contractor: Cummins Construction Corporation, Baltimore, Md.
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Contractor: Simmons-O'Connor Co., Ft. Wayne, Ind.
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Contractor: J. H. Collins, Spokane, Wash.
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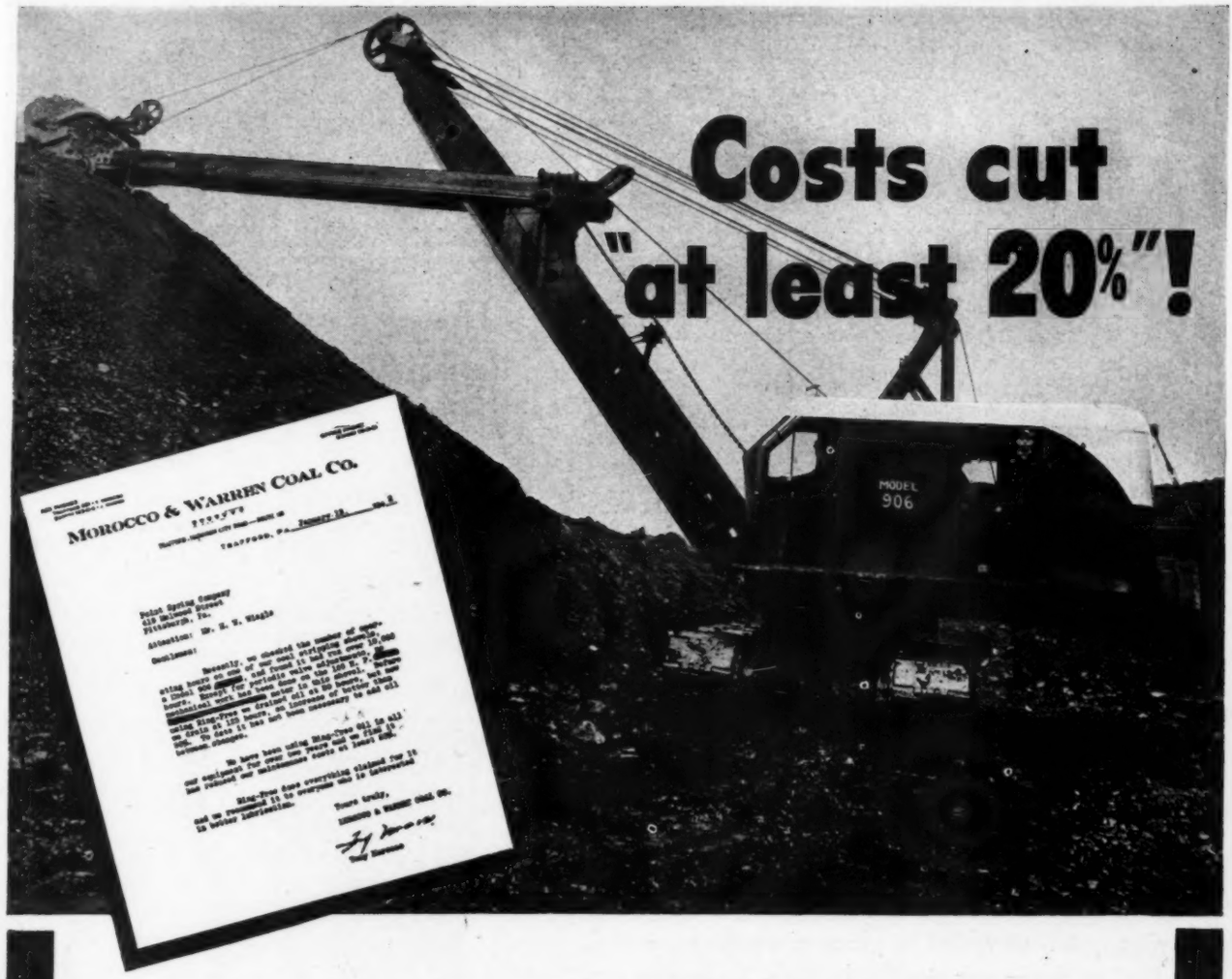


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Single 34E Drum
MULTIFOOTE

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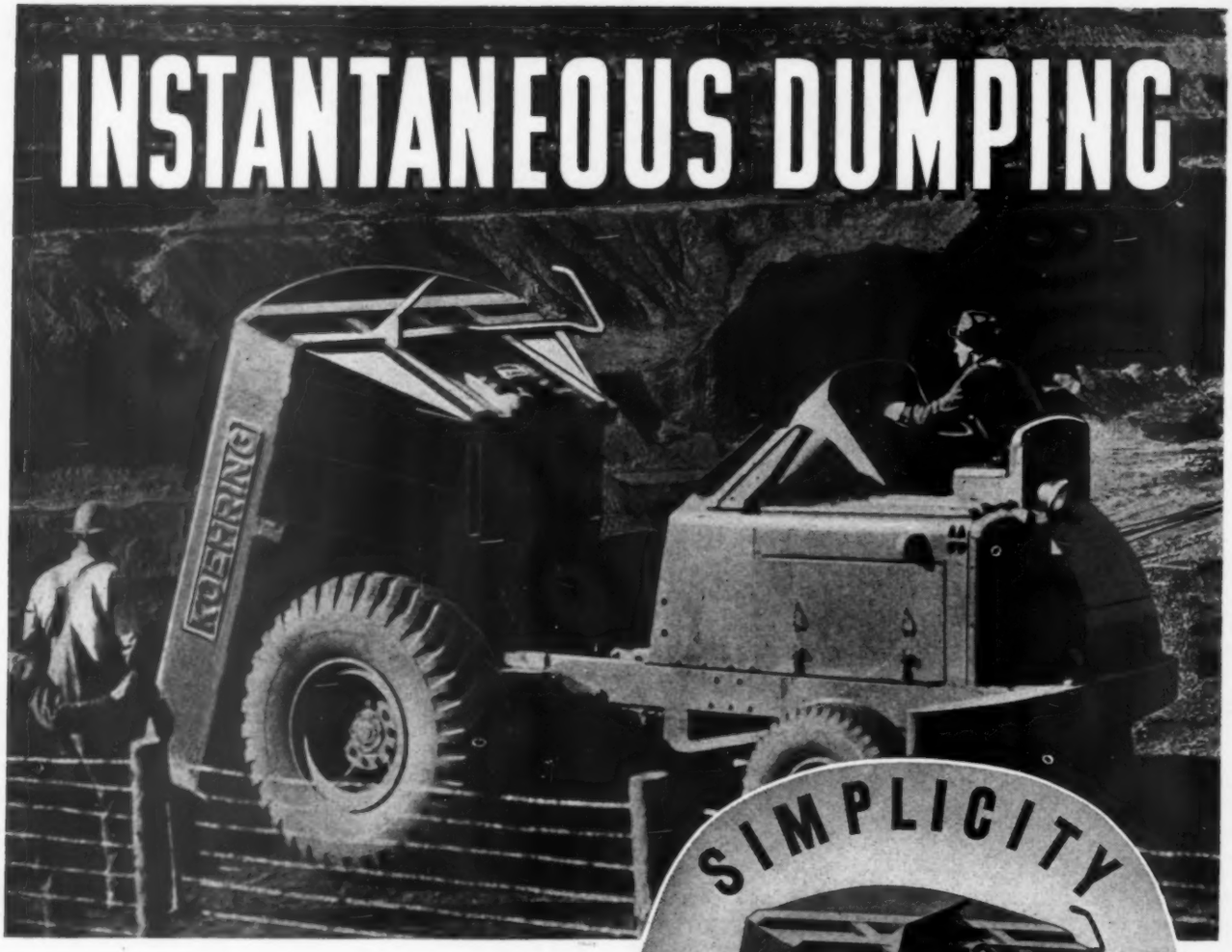


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**HEAVY-DUTY CONSTRUCTION EQUIPMENT**

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## *Compact power and endurance*

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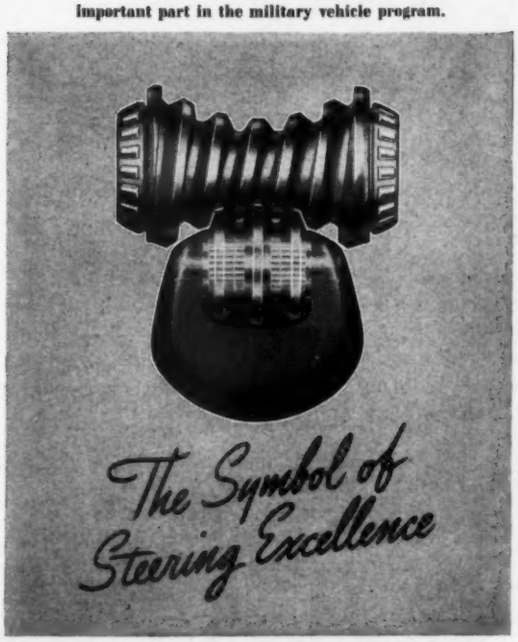
Gemmer Steering is playing an important part in the military vehicle program.




**GEMMER MANUFACTURING COMPANY • 6400 Mt. Elliott Ave., Detroit, Mich.**

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## CORRUGATED

## INSTALLED WITH OR WITHOUT HEADWALLS

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To use GOHI Corrugated Pipe is to make sure of complete protection to highways, airports, railways, parks, athletic fields, and all other public and private improvements that must be safeguarded against the world's greatest menace — water out of control.

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Yes—Pioneer has enlisted for the duration. At CAMP CUSTER in Michigan, seven Pioneer Plants are producing materials—concrete aggregates—stabilized materials—base course—and surfacing materials. Pioneer Plants are producing aggregates for new Airports—Army Camps—Navy Bases, and all types of new defense projects where they need thousands of tons of aggregate—and they need it now.

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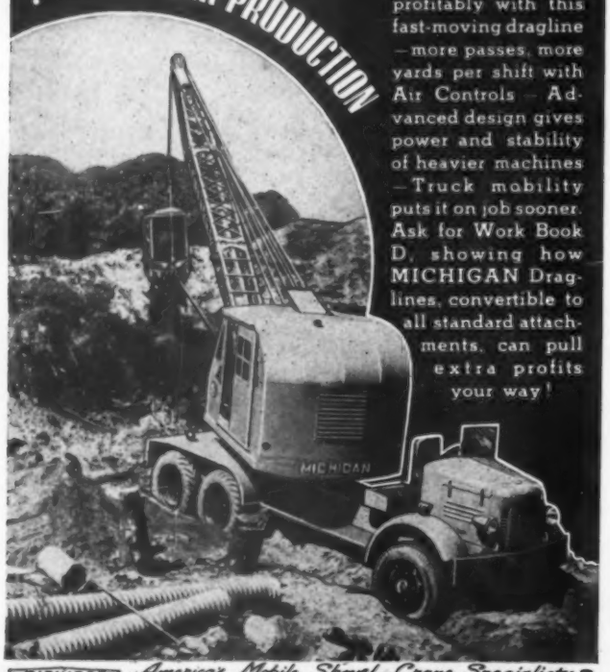
. . . for PEAK PRODUCTION

Extra work handled profitably with this fast-moving dragline — more passes, more yards per shift with Air Controls — Advanced design gives power and stability of heavier machines — Truck mobility puts it on job sooner. Ask for Work Book D, showing how MICHIGAN Draglines, convertible to all standard attachments, can pull extra profits your way!



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MICHIGAN POWER SHOVEL CO.
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Spend a pleasant hour or evening in the famous BAR and CAFE LOUNGE

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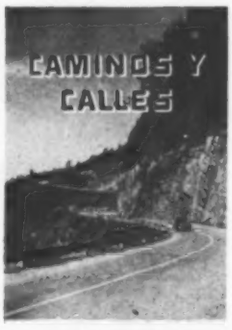
LATIN-AMERICAN MARKET FOR HIGHWAY EQUIPMENT WELCOMES CAMINOS Y CALLES

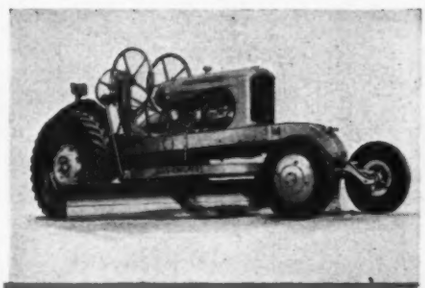



Hundreds of responses have been received from readers in all the Central and South American countries expressing their enthusiasm about this magazine which brings to them news of the latest methods of highway construction and of equipment for obtaining the best results. Every country has been heard from. One reader says: "All of the editorial as well as the advertising, in this magazine seems to me to be the most complete that we have in the Spanish language. Much thanks." Write for particulars and send your message to this rapidly growing market in the March-April issue.

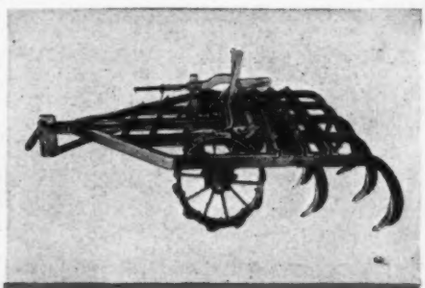
CAMINOS Y CALLES

*Published by:* Gillette Publishing Company, 330 South Wells St., Chicago, Illinois

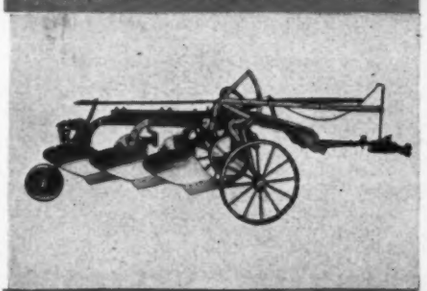
# Heavy-Duty Tools That "Stand the Gaff" ON SOIL-CEMENT STABILIZATION



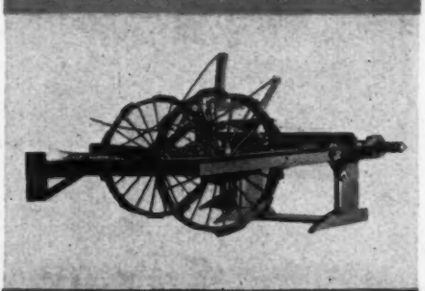
Model W-Speed Patrol for pulling-in edges, shaping and finishing. 10' blade, hand control.



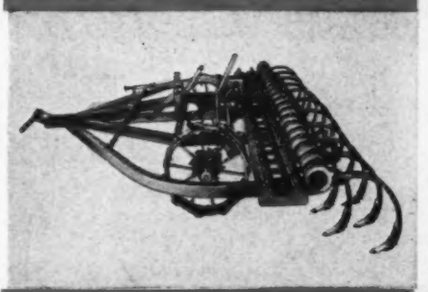
Extra heavy weight chisel for light ripping, mixing and pulverization. Depth control.



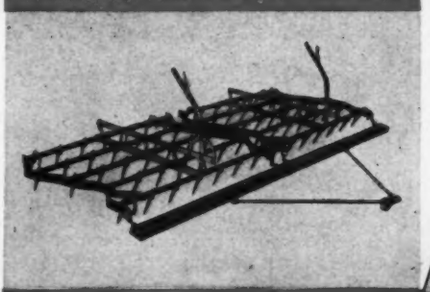
A-C high speed plows provide good mixing action and assure uniform sub-grade.



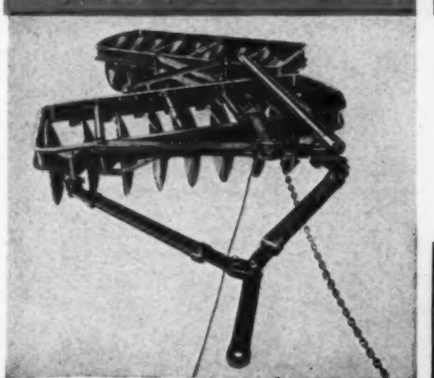
A-C sub-grader scarifies hard surfaced roads and maintains level sub-grade. Depth control.



Big, heavy-duty, soil-cement mixer with flexible coil shank teeth. Depth control.



All-steel spike tooth harrow for leveling cement and producing surface mulch for rolling.



Extra heavy, offset disc harrow for pulverization and mixing. Easy turning, depth control.

Here are the kind of tools you need for soil-cement stabilization —long-wearing . . . tough . . . powerful . . . economical! Tools that have had years of service under the most difficult conditions on every type of soil. Tools that have proved they can handle any soil-cement mixture in stride —loam, clay, sand or gravel. A wide selection . . . from one source! One supplier . . . one service! Rippers, chisels, discs, scarifiers, plows and spike tooth harrows, for pulverizing, rooting and mixing . . . in addition to sheep foot tamping rollers, water spreaders, motor graders, wheel and crawler tractors for compacting, watering, grading and drawbar work! For complete information write for booklet: "Allis-Chalmers Equipment For Soil-Stabilization."

*Get all the facts*

**Write for this new booklet . . . "Equipment For Soil-Stabilization."**

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TRACTOR DIVISION · MILWAUKEE · U. S. A.

**POWER** IT DOESN'T COST . . . *it Pays!*

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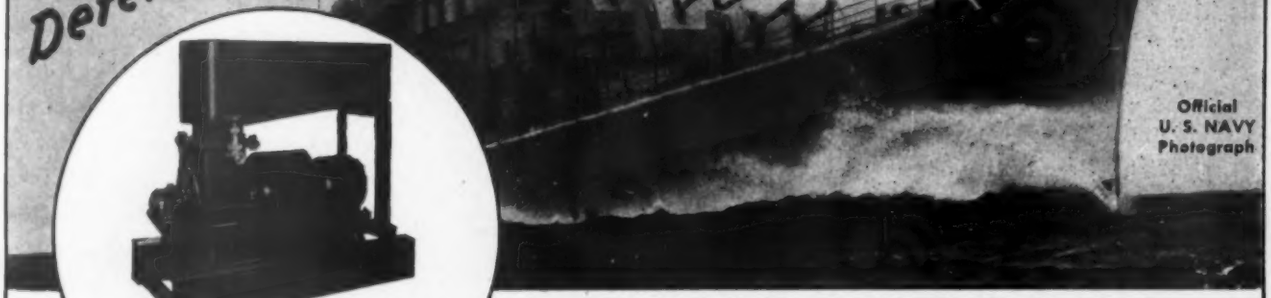
*Buy U.S. Defence Bonds*



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For Battleships and Merchant Marine

Gruendler's Engineering proved!—Equipment that stands up under severe tests—functioning smoothly and faultlessly day in and day out. 57 years building reduction machinery—meeting the demands of the American Way in time of Peace and War.

*Keep 'em Flying!*

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Stationary — Portable
**ROCK CRUSHING EQUIPMENT**

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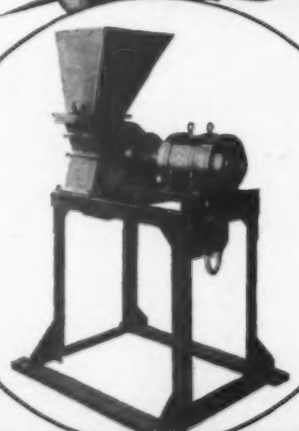
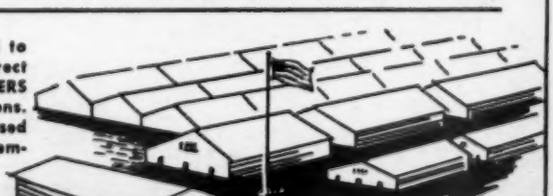
Let our Engineering Division supply you with Blue Prints, Catalogs and Specifications to help work out your specific problems.



**COAL PULVERIZERS for CAMP CANTONMENTS**

Coal samples prepared to proper fineness for correct heating of CAMP QUARTERS and its mechanical functions. Many other Pulverizers used for Defense in heavy chemicals, etc.



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TODAY'S HEADLINES
with tomorrow
in mind
IRON ORE, the birthright of steel, has joined forces with the contractors of America in the form of MARION shovels, draglines, cranes, clamshells and pull-shovels in a sincere all-out effort to help win the war. Along the entire construction defense front, you see MARIONS in action.
THE MARION STEAM SHOVEL COMPANY
MARION, OHIO, U. S. A.
Offices in all principal cities
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MARION
SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • PULL-SHOVELS • WALKERS
Gasoline — Diesel — Electric — ¾ cubic yard to 35 cubic yards

# It Won't Happen Here!

## with Universals on the Job

In World War I the A.E.F. spent half its time digging itself out of chuck holes and wallows—hydroplanes could land on airports almost all the time. That was *over there!*

*But it won't happen here,* thanks to Universal Portable Crushing Plants which are turning out specification chips, aggregates and base course material for hundreds of airports, camps, naval bases, access roads and other defense projects.

*Universals are patriotic* because they turn out material faster, require fewer repairs, thereby saving strategic materials and they conserve fuel! You can do more for Uncle Sam and do better for yourself with a Universal. Everything for crushing, pulverizing, screening, loading, washing and storage.

**UNIVERSAL CRUSHER CO.**
631 C Ave. West
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Triangle Construction Co., Boise, Idaho, chose a Universal Jaw Crusher for their composite plant (on right) to make material for Walla Walla, Wash. airport. Averages 2,000 tons a day.

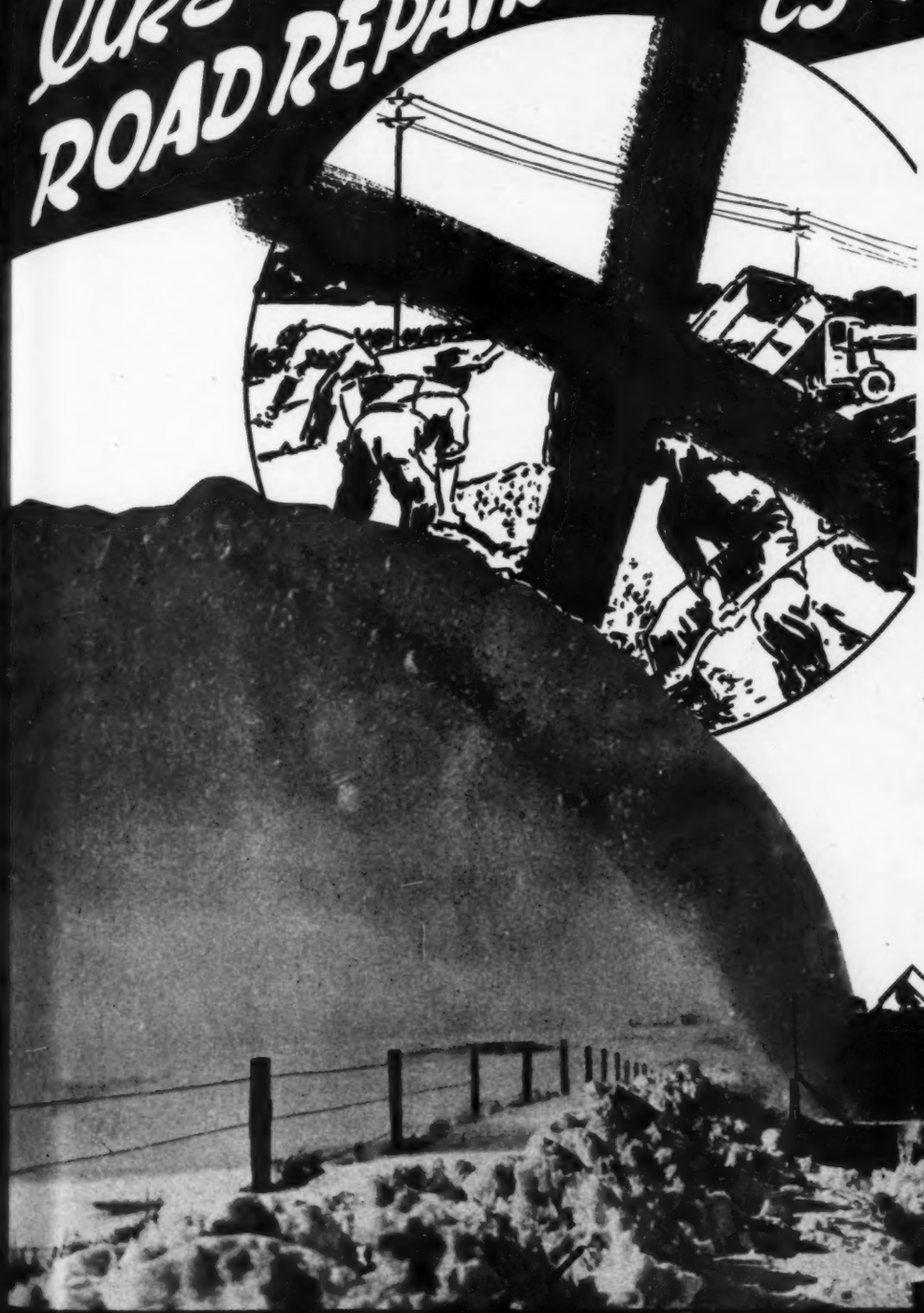
Below: "Pacemaker" Quarry Plant with "Two-in-One" Rolls makes high yardages of defense material at low cost per yard for Halvorson Bros., Rochester, Minn.

Universals are putting a firm base under Canadian defense, too—a Junior Gravelmaster (above) crowds out airport material for W. B. Uren, Contractor of St. Georges, Ont.

# UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

# In times like these ROAD REPAIR EXPENSE is Waste!



SPRING road destruction is coming again! *This* is the month to begin thinking about road repair, not after the damage is done. There is going to be miles of good road rutted and gutted by snow water from roadside snow banks. There is going to be tons of gravel to haul — and thousands of dollars worth of repair work to do.

In times like these this is sheer waste, for a large part of this can be saved for new work. And that is Snogo's job — to save money and lives. Snogo can save miles of repair work.

With Snogo, you can toss those destructive banks into the fields and let the ditches do the job they were built to do. In some counties, Snogo has paid for itself in the reduction of road repair and in the reduced expense of gravel and gravel haulage. And Snogo is a proved unit — the only machine of its type with over 15 years of actual field operation behind it. Snogo's dependability means open roads. Defense goods move, defense workers get to their jobs — Let's keep 'em rolling at the lowest possible cost.

**KLAUER MANUFACTURING CO.**
**Dubuque, Iowa**

THERE IS A SNOGO FOR EVERY BUDGET—FROM A 1½ TON TO THE LARGEST FOUR WHEEL DRIVE TYPE OF TRUCK

# SNOGO

For Complete Snow Removal

*Defense Depends on Open Roads*

# ANNOUNCING . . .

*the Bucyrus-Erie*

# Transit Crane

## performance on wheels!

**Designed exclusively for crane-excavator service from cab to tail light, from boom point to outriggers the new Transit Crane combines speed and dependability to meet the requirements of rush wartime jobs.**

**Hoist and swing speeds are synchronized to give a high-speed cycle. A fully independent boom hoist, giving power control of raising and lowering, permits extreme accuracy in load handling. Extra boom sections can easily be added or removed to fit boom length to the individual job. Open-throated boom permits easy rigging for multi-part lines. Field conversion from crane to clamshell, dragline, shovel or dragshovel is easy. The wheel mounting provides an all-welded base with maximum strength per pound of weight. Tandem rear axles mounted on an equalizer beam assure full traction over rough ground. Dual worm drive provides smooth application of power. Ten speeds forward and two reverse give a choice of speed-power combinations to fit a wide range of travel conditions.**

**There are a host of features that contribute to the outstanding performance of this fast-working, fast-moving crane. If you have work for a unit of this type, write for full details on the new Transit Crane.**

BUCYRUS ERIE
2 MODELS AVAILABLE
22-B
Maximum crane rating, 40,000 pounds; travel speeds from 2 to 31 m. p. h.; ¾ yard clamshell, dragline, shovel and dragshovel.
15-B
Maximum crane rating, 20,000 pounds; travel speeds from 2.3 to 27.5 m. p. h.; ½ yard clamshell, dragline, shovel and dragshovel
B 76

# Bucyrus·Erie

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*spread the load on a timber joint more equally over the cross-section of the wood.*

**The TECO CONNECTOR SYSTEM IS.....**
. . . a new method of structural engineering in timber that strengthens joints and permits lighter members to do work that formerly required heavier timber.

**The TECO CONNECTOR SYSTEM HAS.....**
. . . reduced man hours on the job by complete prefabrication of truss and frame assemblies.

**The TECO CONNECTOR SYSTEM OFFERS.....**
. . . a typical design service and technical engineering data which has already aided hundreds of architects and engineers.

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TIMBER ENGINEERING COMPANY, INC. Dept. S-2,
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Please send me without cost or obligation complete information on the TECO Connector System of construction.

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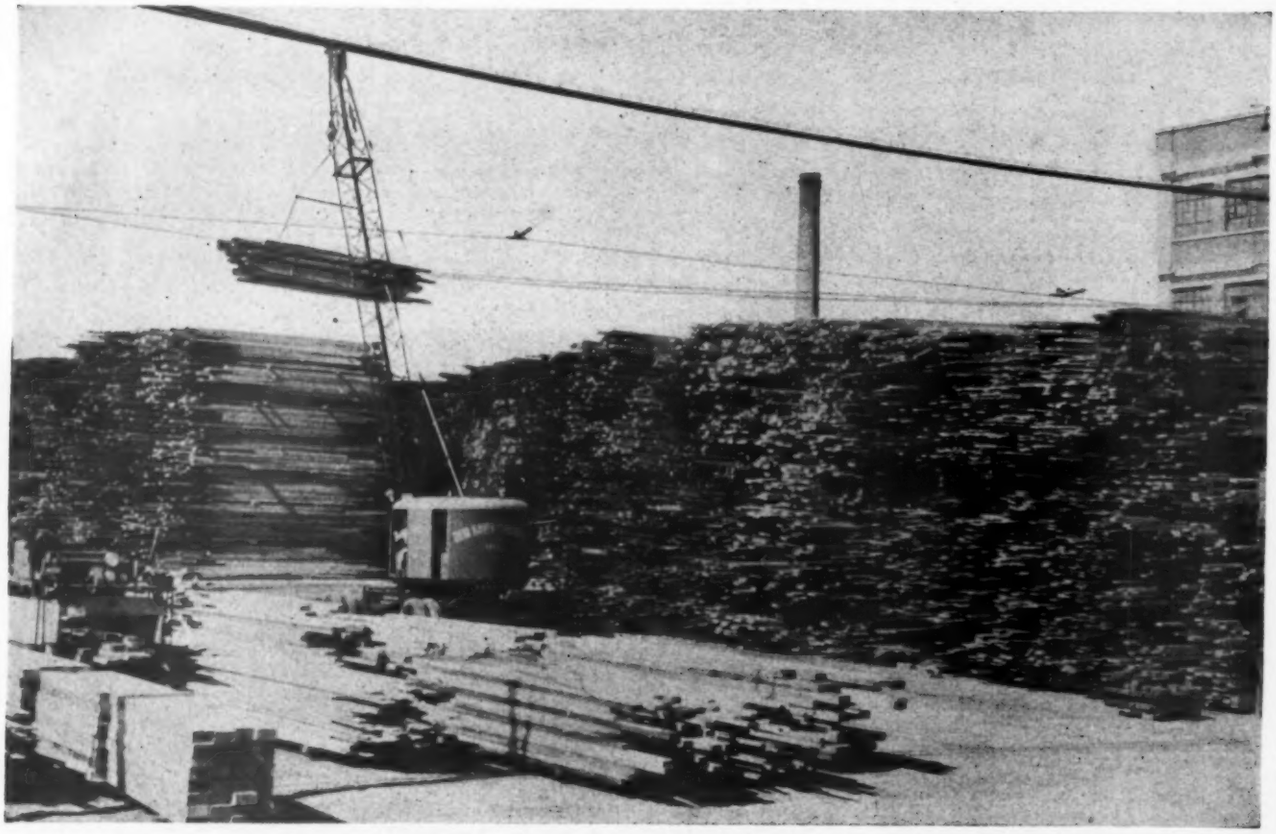

GENERAL

SUPERCRANE handling lumber for New Haven Terminal, Inc. The SUPERCRANE moves quietly, smoothly and efficiently without damage to concrete, planking or any other surface.

## MOVE MORE, FASTER, FOR LESS

The GENERAL SUPERCRANE is a necessity on any job that requires more work per day, more speed on the job, and lower operating costs.

How can the GENERAL SUPERCRANE do all these things? It is self propelled—mounted on Pneumatic tires—operated by one man—powered by one engine—and, well, why not send for new illustrated bulletin? It's free.

The OSGOOD COMPANY
Sizes: ½ to 2½ Cu. Yd.
Diesel - Oil - Gas - Electric
Associated with
The GENERAL EXCAVATOR CO.

The HERCULES COMPANY
HERCULES *IRONEROLLERS*
6 to 12 Tons
Diesel or Gasoline
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GENERAL

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Sizes:
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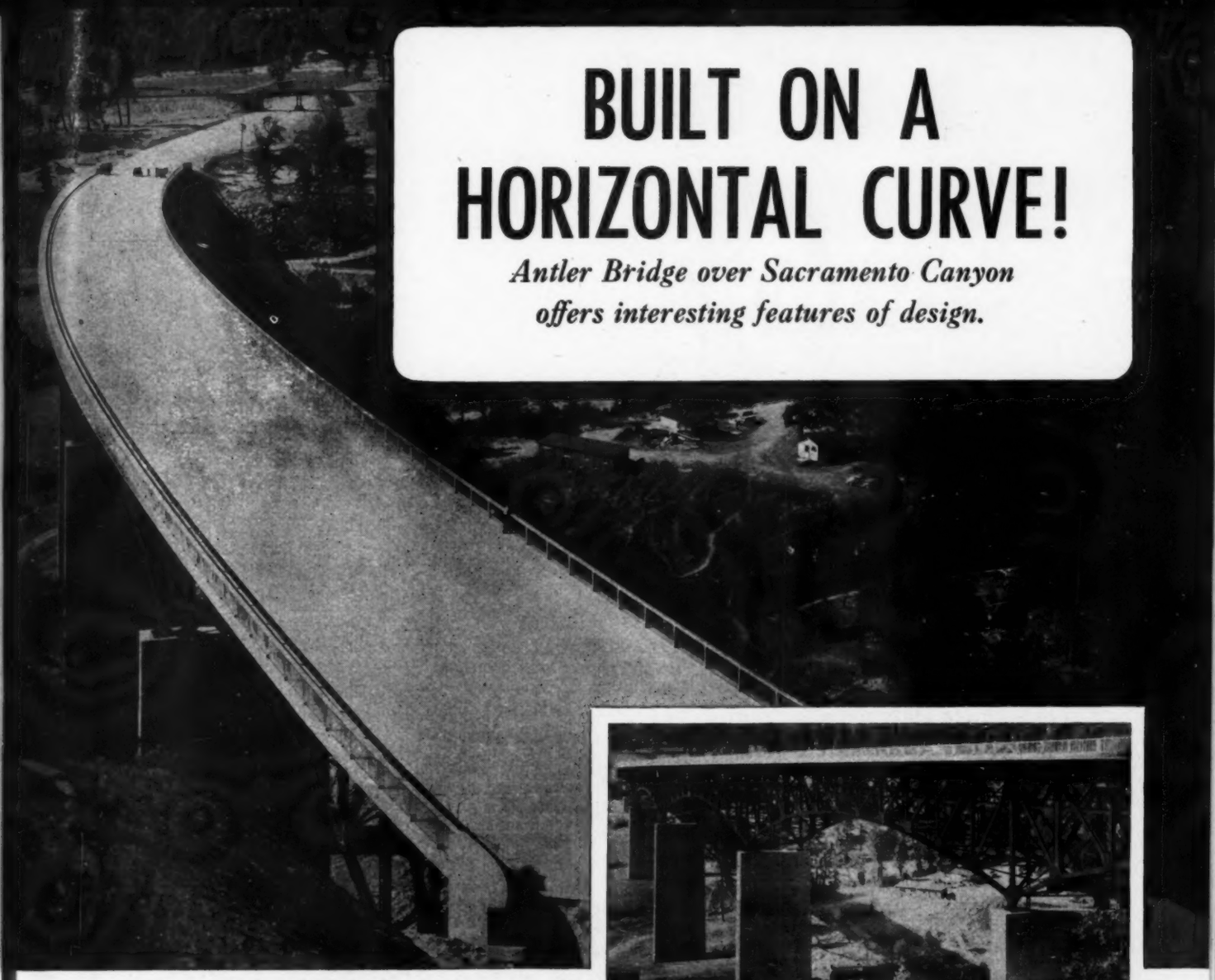
SHOVELS
DRAGLINES - CRANES
Crawler & Wheel Mounted

THE GENERAL EXCAVATOR COMPANY, Marion, Ohio

# BUILT ON A HORIZONTAL CURVE!

***Antler Bridge over Sacramento Canyon offers interesting features of design.***



*The Antler Bridge, built jointly by the U. S. Bureau of Reclamation and the State of California, was designed and constructed under the direction of the State Highway Engineers. The United Concrete Pipe Corporation was the General Contractor.*

PERHAPS the major project in the relocation of approximately 16 miles of state highway, made necessary by the construction of Shasta Dam, is the Antler Bridge.

It spans the Sacramento River Canyon, at Antler, California, some 18 miles above the site of Shasta Dam.

This is an impressive 1330-foot deck structure carrying a 50-foot, 4-lane concrete roadway flanked by 2½-foot sidewalks. The roadway is built on a vertical grade descending northwardly. It sweeps across the canyon on a horizontal curve of 850-foot radius. Its lines are pleasingly symmetrical.

Of the six supporting concrete piers, the tallest rises 172 feet above its footing. The highest point of the roadway deck is some 210 feet above the low water of the Sacramento. However, upon the completion of Shasta Dam, the backed-up waters will come to within 80 feet of the highest point—practically leveling-off with the tops of the piers at the low end of the structure.

**ROADWAY VIEW AND ELEVATION OF THE ANTLER BRIDGE.** The impounded waters of Shasta Dam eventually will rise to the approximate level of the concrete pier-tops, inundating the Sacramento river valley.

The steel superstructure, excepting for short beam approach spans at either end, is a symmetrical arrangement of 5 truss spans: two of 189 ft., two of 252 ft., and a central span of 273 ft. The 189-ft. and 252-ft. spans are grouped into two continuous units. Each unit cantilevers 63 feet beyond the central piers to support the 147-ft. suspended truss of the 273-ft. central span; also cantilevers 42 feet beyond the end piers to carry the beam span approaches. Of unusual interest is the truss design which utilized throughout CB Sections for component members—replacing the conventional laced and plated assemblies.

American Bridge Company, as sub-contractor to Columbia Steel Company, fabricated and erected the approximately 1700 tons of steel which entered into this construction.

## AMERICAN BRIDGE COMPANY

*General Offices:* **Frick Building, Pittsburgh, Pa.**

**Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit**
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**Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York**

UNITED STATES STEEL

**BEST ON A WIDE VARIETY OF JOBS**

"During the many years I have owned A-W BADGERS, I have excavated a number of railroad subways between pile bents where full revolving shovels could not have been used . . . excavated narrow alleys just barely wide enough to take the crawler tread on the machine . . . erected structural steel beams for bridge floors that were much heavier than could be handled by any other type of machine. In fact, the A-W BADGER is the most versatile and most satisfactory machine I have ever owned."

# BUILDING UP OUTPUT RECORDS

## WHERE NO OTHER SHOVEL COULD GO

● Because the half-yard BADGER swings less dead weight to move more dirt, it rivals larger shovels in output capacity. An exceptionally low center of gravity and a single line pull on the hoist drum of 10,000 lbs., together with a positive, powerful chain crowd give the BADGER the power and stability to handle any diggable material with maximum speed.

This rugged, big capacity, fast-moving shovel is exceptionally economical to operate because it wastes no fuel or power swinging unproductive weight. It performs with equal efficiency as a shovel, dragline, trench hoe, pile driver or skimmer. Investigate its record of efficiency and economy on a wide variety of jobs.

THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois

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# Short work for a BUCKEYE!

HERE'S a step by step picture of Ray Kebbe's Diesel-powered Cletrac and Buckeye Bulldozer smashing through on a highway relocation job in Michigan with 'skinner Tony Dertz at the controls.

Buckeye Bulldozers make short work of jobs like this. They're built to take a beating and they're lightning-fast with Buckeye fingertip cable control that gives you power to spare on the heavy lifts! In dirt moving, Buckeye blades dig their own way and *roll* the dirt ahead for bigger payloads every time. Buckeye engineered balance means full traction behind the load and less wear and tear on the tractor. And the new Buckeye UNI-TILT design gives you *interchangeable* blades plus a patented tilting action that's adjusted by a twist of the wrist.

Plan now to put Buckeye 'Dozers on your machines. Ask for complete details.

**THE BUCKEYE TRACTION DITCHER CO.**
**FINDLAY • OHIO**

## Built by Buckeye

**CONVERTIBLE SHOVELS, TRENCHERS AND BACKFILLERS, TRACTOR EQUIPMENT, R-B FINEGRADERS, ROAD WIDENERS AND SPREADERS**

CHECK PAGE 69

# A NEW COST DATA BOOK

## Road and Street Construction Methods and Costs

BY
HALBERT P. GILLETTE
AND
JOHN C. BLACK

This book was planned and compiled expressly for use by contractors, engineers and highway officials.

It is not a textbook, but is a compendium of data carefully selected with reference to their usability by highway builders and other persons concerned with highway construction costs.

In general the data are of two main classes—dollar and cents costs per mile, per square yard, per cubic yard, and the like, for use in quick approximate estimates; and details of material, labor and equipment costs, with records of man-hours and machine-hours, for use in close estimating and in studies to reduce costs or improve methods.

The data are from a great number of different sources, and are in widely varying detail.

All major articles carry descriptions to show clearly the class of work and the methods for which costs are given, and to provide a basis for further reference and study if desired.

Location and date of job and the source of information are given in the title and introduction to each article.

The grouping of subjects in chapters is convenient, but an unusually complete index is furnished as the main guide to any subject or sub-subject sought.

The authors are both men of practical experience in highway and other construction. Both are members of the American Society of Civil Engineers.

The book is filled with useful data, and its answer to just one question may easily be worth hundreds of times its price.

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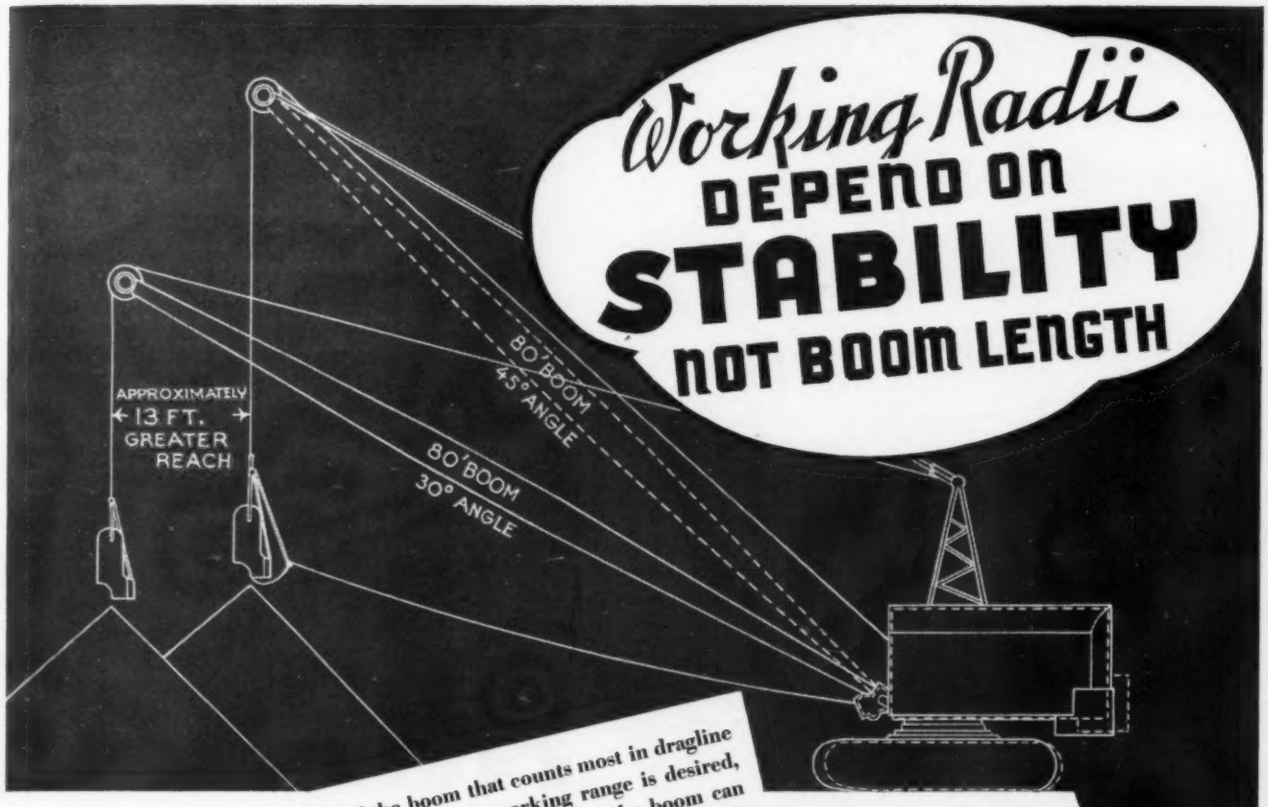
### *Outline of Contents*

**CHAPTER 1. INTRODUCTION**—Brief discussions of construction costs, prices, profits and the uses of cost data.
**CHAPTER 2. COST INDEXES**—Indexes of the U. S. Public Roads Administration and Interstate Commerce Commission, with brief explanations of their construction, uses and limitations.
**CHAPTER 3. OVERHEAD COSTS**—Separate discussions of the overheads incurred by contractors and by states, counties and cities.
**CHAPTER 4. ENGINEERING**—Data from states, cities and other sources on the costs of various kinds of surveys and other engineering. There are brief articles on aerial surveys and seismographic soil and rock surveys.
**CHAPTER 5. RIGHT-OF-WAY**—A general discussion followed by records of actual experience and costs.
**CHAPTER 6. EQUIPMENT**—This chapter contains several rental and ownership expense schedules in full detail, followed by articles on operating and maintenance costs, including records of fuels, lubricants, etc., a mathematical analysis of the problems of selecting and retiring machines, and a table of depreciation rates.
**CHAPTER 7. LABOR**—Schedules of established minimum wage scales and records of wage rates in various states; comparisons of contract work and day labor; convict labor costs and other pertinent matter.
**CHAPTER 8. CLEARING AND GRUBBING**—Records of clearing with tractor-mounted equipment, hand and horse methods, stump blasting, etc.
**CHAPTER 9. GRADING**—Eighty-four pages of articles on grading with power shovels, scrapers of various types and sizes, elevators, blade graders, buildozers, etc.; hydraulic grading; rock drilling and blasting; winter grading; special swamp grading; minor operations and hand work.
**CHAPTER 10. HAULING AND HANDLING MATERIALS**—Studies of hauling operations on power shovel jobs, concrete construction and bituminous construction; truck movements at yards; industrial railways; team and wagon hauling; and other articles.
**CHAPTER 11. PRODUCTION OF AGGREGATES**—Articles on labor requirements and costs of producing sand, gravel and crushed stone at various locations.
**CHAPTER 12. UNTREATED BASES AND SURFACES**—Waterbound macadam, crushed rock and gravel construction.
**CHAPTER 13. STABILIZATION OF BASES AND SURFACES**—This chapter is devoted chiefly to work with calcium chloride, articles on portland cement and bituminous stabilization being given in the chapters on concrete and bituminous construction.
**CHAPTER 14. BITUMINOUS SURFACES AND BASES**—The five parts of this long chapter contain articles on various methods in different states. Part 1, Surface Treatments; Part 2, Bituminous Macadam; Part 3, Mixed-in-Place Construction; Part 4, Traveling Plant Construction; Part 5, Stationary Plant Construction.
**CHAPTER 15. CONCRETE SURFACES AND BASES**—Contains numerous detailed records of construction. There are articles on work with 27-E pavers, 34-E pavers, tandem set-ups, batching, hauling, curing, joints, cement-bound macadam, soil-cement roads, stabilization, and other subjects.
**CHAPTER 16. BRICK PAVEMENTS**—Records of brick pavement construction from various cities and states, including an article on vibrated monolithic. Short references to granite block.
**CHAPTER 17. SIDEWALKS, CURBS AND GUTTERS**—Miscellaneous prices and details of construction.
**CHAPTER 18. WALLS, FENCES AND GUARD RAILS**—A brief chapter of data on these items of highway construction.
**CHAPTER 19. BRIDGES AND CULVERTS**—Cost data on a large number of steel, concrete and timber bridges and grade separations—also culverts of various types. There are two articles on pump installations for underpass drainage.
**CHAPTER 20. TUNNEL CONSTRUCTION**—Detailed descriptions and data on the construction of 27 highway tunnels in the West.
**CHAPTER 21. GRASS, SHRUBS AND TREES**—Several articles on plantings for landscape improvement and bank protection.
**CHAPTER 22. MISCELLANEOUS**—Data on pedestrian underpasses, street car loading platforms, truck weighing stations, catch basins and manholes, lignin binder, water pumping, signs and markers, traffic striping, parking meters, highway lighting, radio communication with snow plows, accident prevention, and weather and construction.
**INDEX**—Unusually complete: arranged for quick reference and maximum convenience.

# Working Radii DEPEND ON STABILITY NOT BOOM LENGTH




It is the reach not the length of the boom that counts most in dragline work. On levee work or where maximum working range is desired, boom length is not as important as the angle at which the boom can be worked without tipping the machine. Long booms mean only extra weight if the machine is incapable of handling a long boom and load at a low angle to get maximum range so necessary in dragline work. The sketch above shows a comparison in working radii of a properly balanced LIMA dragline equipped with an 80′ boom and a 3 yard bucket, working at a 30° angle and a light weight unstable machine of the same boom length and capacity, but which must be worked at a 45° angle to avoid tipping. LIMA draglines are designed for dragline work. They have such important advantages as—heavy duty truck and machinery frames; proper balance, by placing the machinery well back of the center pin; and long, wide crawlers that add to the stability of the machine as well as reduce ground bearing pressure to a minimum. Remember when buying a dragline, that working radii depend on stability, not boom length.

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ROADS AND STREETS

February, 1942, Vol. 85, No. 2

# Paving at Fort Knox

## *An Unusual Equipment Set-Up Speeds Work for Contractors and Government*

FOUR hundred dollars a day penalty for delay was the "inducement" which led White Consolidated, Inc., of Chicago and Breslin Construction Co., Inc., of Louisville to take certain out-of-the-ordinary measures to speed construction on their 22-mile paving job at Ft. Knox, Kentucky.

The contract, involving 245,000 sq. yd. of concrete pavement and a few minor structures, was awarded by the Constructing Quartermaster, U. S. War Department, to the two firms jointly on June 28, 1941 for a total of $579,075.62. Work was to start July 12 and to be finished November 29 with the contractors just $400 out of pocket for every day longer. There was no bonus for early completion.

**By JOHN C. BLACK**
Field Editor, ROADS AND STREETS

Orders to proceed were issued July 2. Rough grading had been completed to a level approximating the top surface of the pavement in both cuts and fills, thus leaving an average of nearly 7 inches to be removed by the paving contractors. The greatest excess was at the edges of the pavement section. All such material was wasted along the fills. Shoulder grading was not included in the contract, but was done independently by the Contracting Quartermaster as a WPA project.

Construction was scattered widely over the area of Ft. Knox. Pavements were chiefly of 33-ft. width, but there were sections 22-ft. wide, and others 44-ft. Numerous connections and intersections added complications. On many of the roads it was necessary to maintain army and civilian traffic during construction.

### *Pavement Design*

The standard 22-ft. strip consists of a single 9-7-9 section with 2-ft. tapers; while the 33-ft. section is made up of one such 22-ft. strip with an 11-ft. strip (also of 9-7-9 section) laid alongside it. The 44-ft. pavement naturally is made of two of the 22-ft. sections. The concrete mix was designed by the proportioning engineer of the Constructing Quartermaster's office for a minimum compressive

Two 34-E pavers at work on 11-ft. strip adjoining the previously constructed 22-ft. strip. In foreground are the sledges used to haul concrete for curb construction

Stock piles with cranes, bins and batchers. Fine aggregate in foreground (supply low when picture was taken). Coarse aggregate in background

strength of 3500 pounds per sq. in. on 28-day cylinders. The proportions were approximately 1-2¼-3¾. Vibration was required along all forms and joints. Kentucky Department of Highways standards and specifications applied throughout.

Reinforcement is of welded fabric, with transverse wires spaced 12 in. on centers, and longitudinal wires spaced 6 in.; weight, 43 lb. per 100 sq. ft. The wires are No. 6 gauge except for the longitudinals on each side, which are No. 0. Sections are required to lap at least 12 in. The reinforcement is located 2 in. below finished pavement surface.

Lip curb, 9 in. wide and 3 in. at the edge, is required on both sides throughout. All concrete is laid on subgrade felt or paper.

### *Construction Operations*

To meet their rather stiff construction schedule, the contractors brought in all the equipment that they thought they could use to advantage in single shift operations. Much of it was bought new. Labor conditions and slow delivery of reinforcing steel made it impractical to work double shifts.

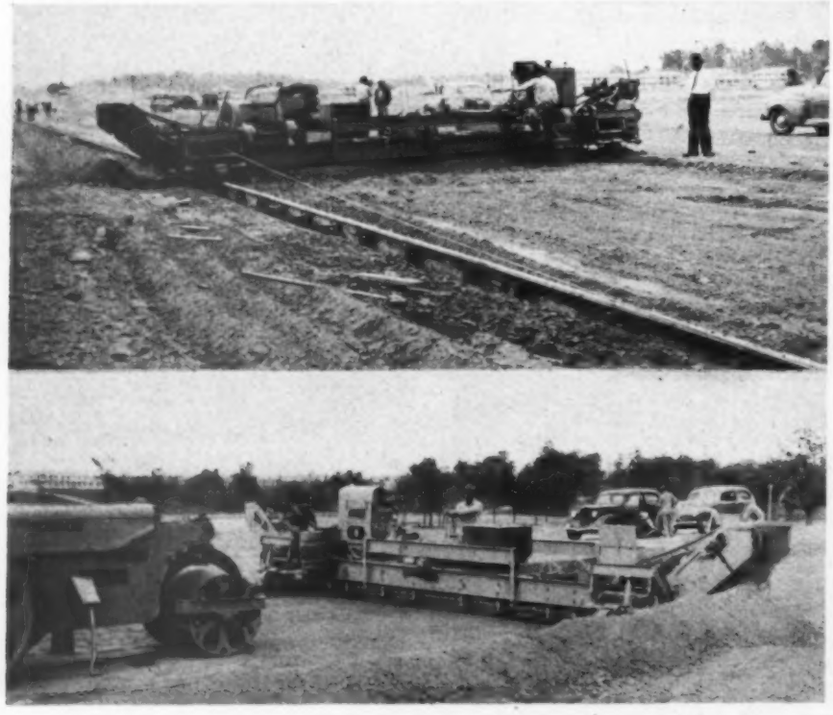
Procedure with the 33-ft. pavement was to lay a 22-ft. section first, and a few weeks later to place the remaining 11 ft. beside it. Numerous loops and connections in the road system made it possible to do this with a minimum shifting of equipment. The same pavers were used on both the 22-ft. and the 11-ft sections; but most of the other units—finegraders, finishers, bull floats, etc.—were provided separately for each width.

A mechanical concrete spreader of the screw type was used on the 11-ft. construction, the pavers on this work being operated on the finished 22-ft. slab; while on the 22-ft. construction, a mechanical strikeoff pulled by the paver kept hand puddling at a minimum.

Here, briefly, is how White and Breslin did it:

1. Graded the entire 33-ft. width with 5-yd. scraper and motor grader to about 2 in. above subgrade level.
2. Set forms for 22-ft. strip.
3. Finished subgrade with mechanical finegrader and roller.
4. Installed transverse joints.
5. Deposited concrete mixed in first 34-E paver, and struck off to 5-in. depth.
6. Placed mesh reinforcement.
7. Deposited concrete mixed in second 34-E paver.
8. Struck off and finished with transverse machine.
9. Finished with mechanical longitudinal finisher.
10. Hand finished (luting, belting, brooming).
11. Placed and finished lip curb by hand.
12. Sprayed surface with curing coat.

The above steps completed the 22-ft. section. Procedure on the 11-ft. strip was similar except that concrete from the second paver was spread by machine instead of by hand.



Two views of the fine grader at work, showing condition of subgrade before and after its passage

### *A Few Pertinent Details*

Certain details will be of further interest. The blade grader did a fairly thorough job, leaving no more material than could be handled conveniently by the finegrader. The latter machine and the roller finished the surface so closely that concrete losses in the subgrade were less than two percent.

Crusher-run coarse aggregate (maximum 2½ in.) was furnished by the Government from the quarry of Nally and Mudd under a contract with the Constructing Quartermaster. This quarry is conveniently located within the Ft. Knox reservation, and the paving contractors established

their stock piles and batching plant within a few hundred yards of it. Hauling from the crusher bins to stock pile was done by Heib and Scroggins, of Louisville, who also did all batch hauling for White and Breslin. The rock is a very hard limestone, conforming to requirements of Kentucky State Highway specifications.

Fine aggregate and cement were furnished by the contractors, the former being a coarse, sharp sand, dredged from the Ohio River by the Union Sand and Gravel Co., and deliverd by them to the contractors' stock pile. Haul from the river is about 8 miles.

Cement was shipped in bags by rail from the plant of the Kosmos Portland Cement Co. about 15 miles away; and because of a lack of rail access to the job, was then hauled by truck about 1½ miles to the batching plant—a cumbersome and expensive procedure, considering the nearness of the cement mill, but a procedure which apparently could not be avoided. Bulk shipment of cement, which would have been the logical method for a job of this size, was precluded by the lack of both suitably located receiving tracks and proper cement cars.

For a curing cover, the contractors used "Ritecure", a waterproof, viscous and highly adhesive preparation made by the Curing Materials Co. of Pittsburgh, Pa. It is applied as a spray, one gallon covering about 40 sq. yd. of pavement. Two men were kept busy most of the time on this work. This treatment was approved as a curing method, and no other covering or treatment was required.

The only serious stumbling block encountered during construction was in the delivery of reinforcing steel. In spite of this being a defense job with an A-1 J priority, the pouring of concrete was held up until August 6 for lack of mesh, and even then the supply was so far inadequate that the contractors operated only one mixer until September 8. After that date, mesh arrived fast enough to keep the two mixers busy one shift per day, but not more.

Some inconvenience resulted from delayed delivery of the 22-ft. finegrader, which was ordered July 2 and arrived August 24. In the interim the contractors used an old and generally unsatisfactory machine. Later there were difficulties in getting the metal recess center joint, but no serious interference in schedule resulted from that cause.

Weather was generally favorable until early in November when a string of bad days produced a serious interruption of schedule.

Laying subgrade paper. Pavers at work in background

### *The Pace of Operations*

Work completed to September 25 (date of the writer's visit) aggregated 80,000 sq. yd., or approximately one-third of the 245,000 total: and on October 26 the record showed 150,000 sq. yd. or almost two-thirds. After the two pavers went into operation on September 8 the day's run (usually 9 or 9½ hours) averaged about 3500 sq. yd., the best being 1940 linear feet of 22-ft. surface—a total of 4742 sq. yd.—laid in 9½ hours actual working time. This means an average of 204 lin. ft. per hour, which is just about the maximum possible for the first mixer and the finisher—an excellent coordination of machine capacities.

Concrete was mixed in 36-cu. ft. batches, with 8 bags of cement per batch, thus saving all weighing or measuring of cement at the batching plant, and keeping well within the 10% permissible overload of the pavers. Mixing time was one minute. The first paver produced about 60% and the second paver about 40% of the total run. A 27-E would have been ample for the second unit, but interchangeability of the two pavers was an advantage more than offsetting any saving on a smaller machine —especially in view of the necessity for speed. About 600 batches was an average day's run for the two machines.

An efficient, though very humble, item in the equipment set-up consisted of two white mules, each

Transverse and longitudinal finishers at work

Concrete from second paver being spread over reinforcement

hitched to a roughly constructed wooden sledge, or stone boat, with a split section of an ordinary oil drum, in which mixed concrete for lip curb construction was hauled from the second paver. The picture shows them.

### *Equipment*

The major items of mechanical equipment were as follows:

2 Blaw-Knox bins
1 Blaw-Knox batcher

Another view of the 1-mule power sledge and half drum delivering curb concrete

Applying curing compound. The pressure tank containing material is partly visible at left of operator

1 Johnson batcher
1 Osgood crane with 1¼-yard Haiss bucket
1 Lorain crane with 1¼-yard Blaw-Knox bucket
1 Caterpillar diesel tractor, 60 H.P.
1 LeTourneau scraper, 5-yd.
1 Galion motor grader, 12-ft. blade
1 Carr formgrader
1 Buckeye R-B finegrader for 22-ft. strip
1 Buckeye R-B finegrader for 11-ft. strip
1 Huber 5-ton roller on subgrade
1 Jaeger concrete spreader for 11-ft. strip
2 Multifoote single drum 34-E pavers
1 Cleveland concrete strikeoff for 22-ft. strip
1 Cleveland concrete strikeoff for 11-ft. strip
1 Marvel concrete vibrator
1 Jaeger concrete finisher for 22-ft. strip
1 Jaeger concrete finisher for 11-ft. strip
1 Koehring longitudinal finisher for 22-ft. strip
1 Koehring longitudinal finisher for 11-ft strip
3 Ford 1½ ton service trucks for hauling forms, mesh, etc.
Note: Trucks for batch hauling are not included in this list, as that work is all sub-contracted.
1 small compressor on light truck, for cleaning joints before pouring tar.
7500 lin. ft. (approx.) pavement forms—Blaw-Knox; Jaeger, Truscon
2500 lin. ft. curb forms—Heltzel

### *Materials*

Following are the producers of materials used.

Cement—Kosmos Portland Cement Co.
Coarse aggregate — Furnished by Constructing Quartermaster under Nally & Mudd contract.
Fine aggregate—Union Sand and Gravel Co.
Mesh—Pittsburgh Steel Co.
Subgrade felt—asphalt saturated, 48 in. wide, weight 40 lb. per 1000 sq. ft.—Philip Carey Co., Lockland, Cincinnati, Ohio
Metal joints—transverse and longitudinal—Highway Steel Products Co., Chicago Heights, Ill.
Fiber expansion joints — Philip Carey Co., Lockland, Cincinnati, Ohio
Concrete curing material—Ritecure, made by Curing Materials Co., Pittsburgh, Pa.

### *Labor*

The number of men employed was practically constant, and was the same for both the 22-ft. and the 11-ft. strips. There was, however, a slight variation in duties, the 11-ft. job generally requiring 2 less puddlers than the 22-ft. and 2 more concrete finishers to care for the greater length of curb involved.

Union labor—both skilled and common was employed throughout. Time and one-half was paid for all work over 8 hours, and as the grading and yard crews usually worked 10 hours per day, and the concrete crew from 9 to 9½ hours, the bill for overtime was high. Normal crews were as follows:

*Superintendence*

1 superintendent in charge of grade preparation, forms, mixing and placing concrete

Robert Mathers, Chief Inspector

John Campbell, Mixing Inspector

J. K. McMullen, Contractors' Superintendent in charge of materials, batching, curing and clean-up

1 superintendent in charge of procurement of materials, batching, curing and clean-up

*Finegrading and Forms*

1 foreman
2 motor grader operators
1 formgrader operator
4 form setters
1 finegrade machine operator
1 roller operator
14 laborers—finegrading, form and miscellaneous
6 laborers—form pullers

*Aggregates and Batching*

1 foreman
2 cranemen
2 oilers
2 aggregate batchers
2 laborers—cleanup and miscellaneous

Note: Cement is handled entirely by the sub-contractor who does the hauling. Ordinarily 16 men are employed at the cement station, unloading, batching, etc.

*Concrete*

2 mixer operators
1 mechanic
1 finisher operator
1 longitudinal finisher operator
1 finisher foreman
10 concrete finishers
20 laborers — puddlers, 1 vibrator man, joint setters and miscellaneous
10 laborers—finisher helpers, curb builders, curing, etc.

*Miscellaneous*

3 service truck drivers
1 foreman—unloading and transferring mesh
4 laborers—unloading and transferring mesh
2 laborers — cleaning joints and sealing with tar

### *Contractors' Personnel*

The work was handled directly by Donald White, of White Consolidated and Frank Breslin of Breslin Construction Company. Their superintendents on job were Owen Kelly and J. K. McMullen.

Field Party, September 25, 1941. Left to right: William Green, Rodman; Hubert David, Rodman; Karl S. Lane, Chief of Party; Robert Lykins, Rodman; Creed Penick, Instrumentman; Walter Malone, Rodman

James H. Wingard, Post Engineer

### *Engineering Administration and Personnel*

Prior to the approval of the project the Constructing Quartermaster arranged through the Bureau of Public Roads for the necessary surveys and planning to be done by experienced personnel of the Kentucky Highway Department. These services were performed under the supervision of Mr. C. J. Fuller of the Highway Department. Completed plans were turned over to the Constructing Quartermaster. Award of contract engineering and inspection incidental to construction were performed by the forces of the Constructing Quartermaster under the direct supervision of Mr. J. H. Wingard, Post Engineer.

## Federal Regulation of Trucks Opposed

The Indiana State Highway Commission has filed a formal protest with the U. S. Senate against enactment of a proposal which would take away from the states the right of regulating maximum weights and sizes of trucks, according to S. C. Hadden, chairman of the Commission.

The Commission feels that the proposal would be an encroachment upon the rights of the states since the states have paid for their highways with only small contributions from the federal government for the construction, not the maintenance of roads. The proposal now before the U. S. Senate, members of the State Highway Commission believe, would give the federal government some control over the 76,000 miles of county roads in Indiana and in the end result in federal domination of all local and state highway affairs.

The bill is now before the U. S. Senate Committee on Interstate Commerce.

# Contractor's Organization Worked Smoothly

## *Louisiana Controls Embankment Compaction on New Construction*

**By E. M. GILLEN**
Resident Engineer
Louisiana Department of Highways

FOR some time the highway leading north from Shreveport, Louisiana, has not been adequate to handle the traffic because of its narrow bridges and narrow roadway. A few years ago the Department of Highways made surveys with the intention of relieving the condition which resulted in a decision to relocate the entire route from Shreveport to the Texas line and nearly all of U. S. 71 to the Arkansas line. In the last few years some contracts for both grading and paving have been completed. Without exception these completed sections have been 10 miles or more from the city of Shreveport. In 1938, 1939, 1940 modern bridges for two-lane pavements were built on the new location immediately north of Shreveport and on May 28, 1941, the Central Construction Company of Monroe, Louisiana, was awarded the contract for grading and paving 6.755 miles on the new alignment. The work order on this project was issued January 27, 1941, and actual construction began on July 2, 1941.

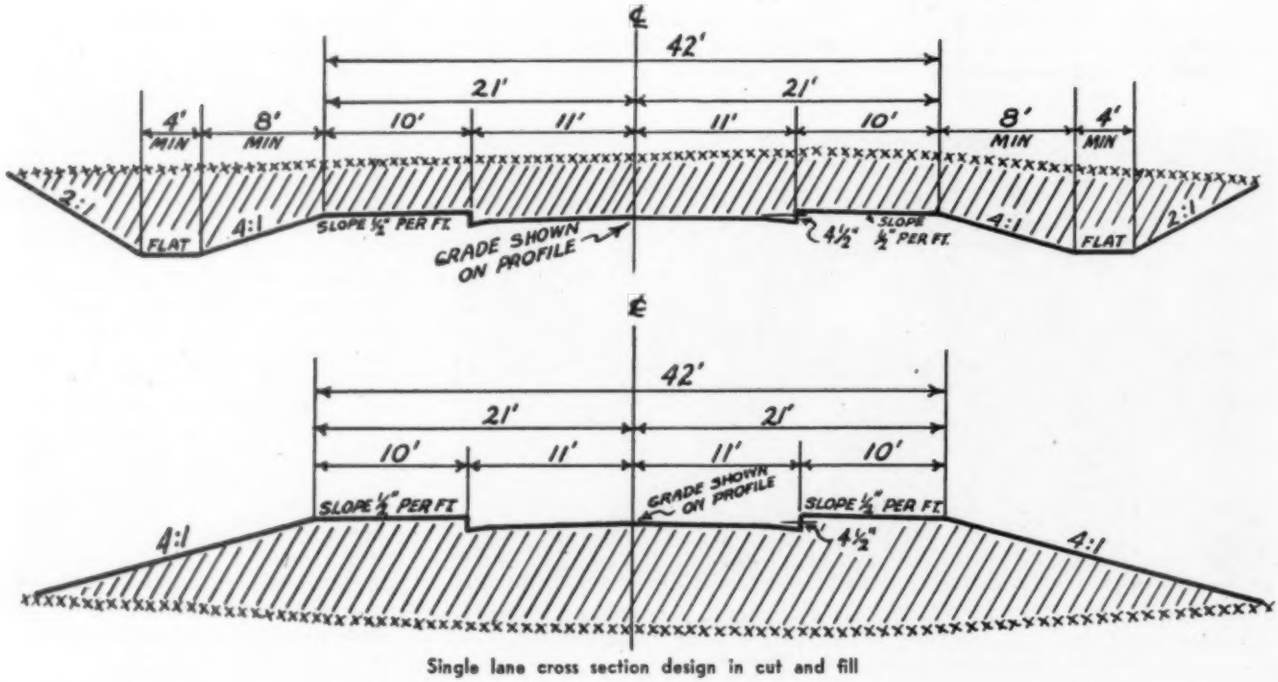
This contract begins at the city limits of Shreveport. Both U. S. 71 and State Route 8 are to be routed over the first 3½ miles which is built 78 feet wide from shoulder to shoulder to accommodate two slabs 21 feet and 6 inches wide with a 15-foot parkway between them. These dimensions and other important characteristics are shown in the accompanying cross section drawings.

### *Clearing*

Three foremen, each with 25 men, started clearing the right-of-way on July 2nd. All small brush, vines, etc., were cut with brush hooks. The larger trees were sawed down. The trees in cut sections were left high for grubbing and in fill sections over two feet, the stumps were left flush with the ground. The entire right-of-way was cleared within 30 days. This amounted to about 60 acres. All shade trees which were not in the roadway section were left standing.

### *Grubbing*

Two foremen, each with 10 men, started grubbing directly behind the clearing crews. Two RD7 Caterpillar diesel tractors with bulldozer attached were assigned to the grubbing crews. The tractors were able to pull most all of the stumps without the use of dynamite. The larger stumps were drilled around by one man and another man handled the powder. An average of 10 sticks of 40 percent Red Cross Extra dynamite, per stump, was used after which the tractors with bulldozers were able to pull the stumps. Other men piled the roots with brush left from clearing and all was burned within the right-of-way limits. The saw logs were piled along the right-of-way for property owners. The grubbing, amounting to about 36 acres, was completed within 30 days after starting.




Single lane cross section design in cut and fill

### *Grading*

Fifteen days after the clearing and grubbing started the contractor had his grading outfit assembled and began moving dirt. The following outfit was assembled:

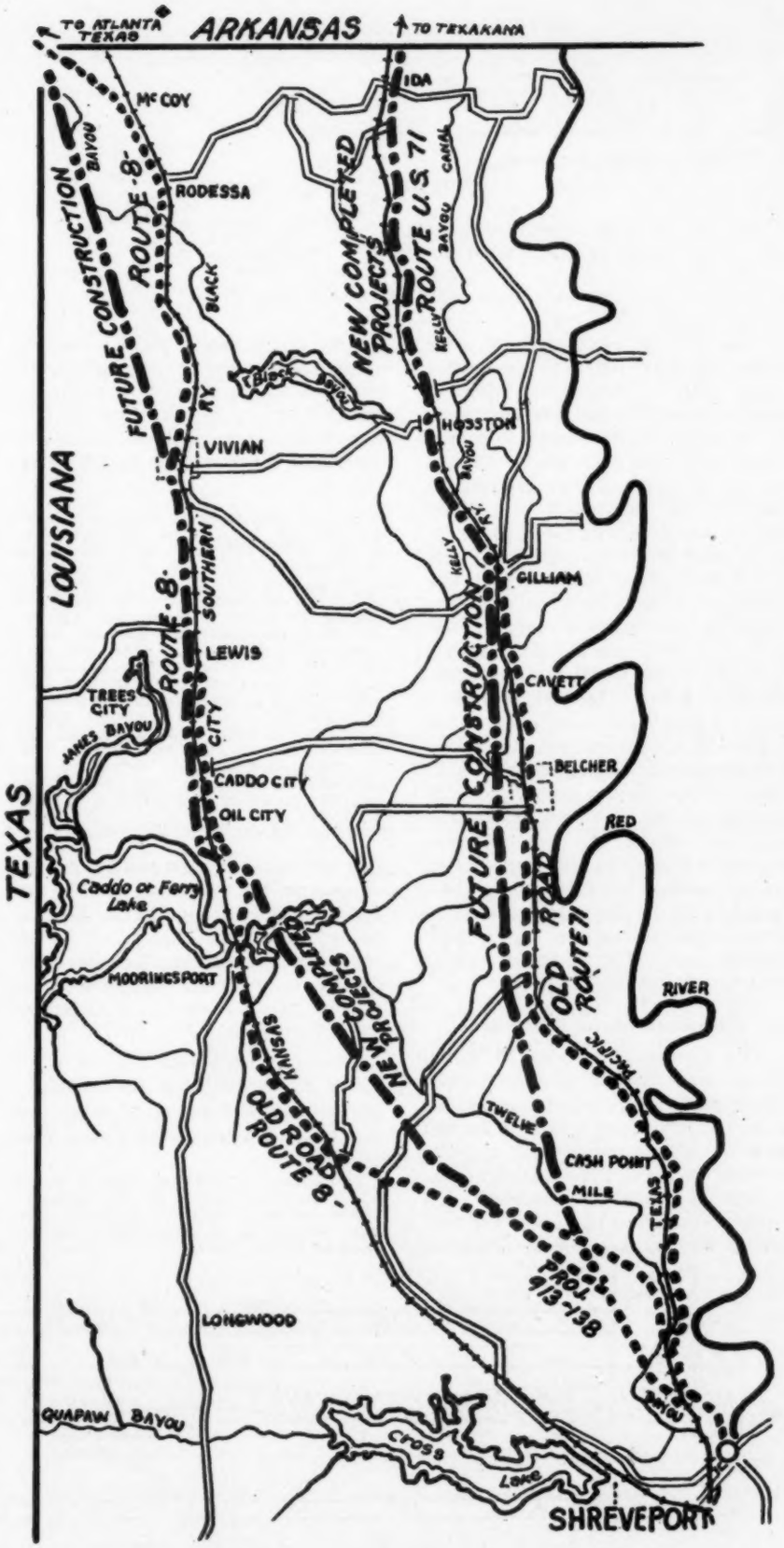
12—1½ ton Ford trucks with dump bodies (hydraulic)
1—Speeder dragline made by Link Belt Corp., 1¼ yd. bucket.
1—Koehring dragline made by Koehring Co. with 1½ yd. bucket.
1—No. 66 Caterpillar grader with 15 ft. blade.
3—8 yd. LeTourneau scrapers powered by 3—RD7 Caterpillar tractors.
2—Lakewood sheepsfoot rollers.
1—Caterpillar RD-8 equipped with bulldozer.
1—Caterpillar D6.

About 550,000 cubic yards were involved in this contract of which 300,000 was borrow material supplied by the contractor from a pit located outside of the right-of-way. The Central Construction Company secured a suitable pit next to the right-of-way at station 590. This was the middle of a fill 4,000 feet long which varied in height from 10 feet to 18 feet. The two drag lines and the trucks began work in the borrow pit. Three scrapers began work in hill sections where the cuts could be worked both ways.

Each outfit had a foreman, service truck and mechanics. The scraper outfit had a roller and bulldozer assigned to it. One roller, tractor and blade, and bulldozer was assigned to the truck outfit. With perfect weather and by working 2 ten-hour shifts a day the contractor moved 200,000 cubic yards of dirt the first month of operation. As soon as the clearing and grubbing was finished two additional 6 cubic yard scrapers were added. On December 30, 1941, the contractor had practically completed all dirt work on the project.

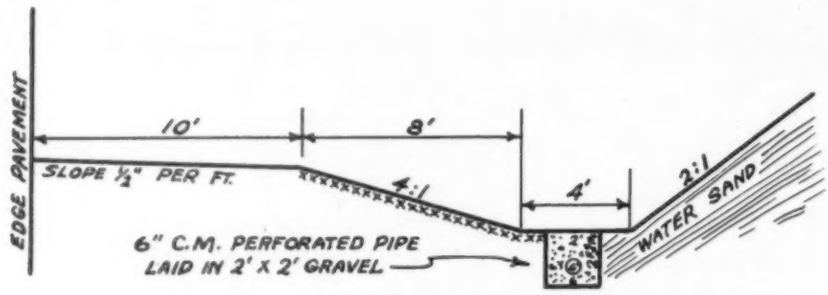
It will be noticed that the yardage dropped off after the first month in spite of the addition of more equipment. This was due to a number of things. The night shift was discontinued which accounted for a large part of the yardage. Another important factor was the lengthening haul from the borrow pit which cut the yardage appreciably.

On the cut and fill sections hauls greater than 700 to 800 feet were left for the drag lines and trucks. The scrapers took out many small cuts from which the haul was less than 500 feet. This small stuff went so fast that the engineers could scarcely keep work staked out ahead but it didn't mean anything as far as the estimate was concerned. However, taking the job as a whole, each scraper averaged about 80 yds. per hour.




Plat showing location of construction work, project 913-138

The dirt on this project was placed in 8-in. horizontal layers (loose mea-




How seepage will be handled in wet cuts

surement) from slope stake to slope stake and then rolled at least three times with a sheepsfoot roller. A sand displacement test was then made by inspector to determine if proper compaction had been given. All dirt on the project had been sampled by the testing laboratory in Baton Rouge, La., and tests made to determine moisture content and maximum compaction. Each class of dirt was noted and a curve made on each. The inspector also made a moisture test and if the moisture did not compare with the curve for that class, additional work had to be done. If the dirt was too dry, water was added at the contractor's expense and if too wet the sheepsfoot had to go over fill until the dirt dried to the proper moisture content. Each layer was tested and approved before the next lift was placed. Because the soils encountered in this project fell in groups A4, A5, and A7 and the dry weight density in some instances ran only 93.3, a more detailed description of the procedure may be interesting.

### *Embankment Control*

The testing laboratory in Baton Rouge had samples of soil for the entire project before construction began. The laboratory classified the soil and ran all necessary tests and developed curves to show classifications, maximum moisture content, and other information for use by the field forces. The engineers on the job knew the soil classification and its various characteristics before the contractor started a fill. As each lift was placed, tests for density and moisture content were made according to the standard procedure for Louisiana which is as follows:

Remove all loose soil from surface of fill over an area 2 feet square where density is desired. Level off surface, remove the soil with auger, or shovel, clean out loose soil and place all soil in pans. Weigh soil removed from hole, mix thoroughly and obtain small sample (100 oz. or 500 grams, depending on the scales available) for moisture determination. Obtain wt./cu. ft. of sand by depositing in bucket through funnel until filled. Use extreme care in striking off excess sand so no settlement occurs in bucket. Weigh a quantity of sand. Deposit sand in the hole until nearly full, finish filling hole by means of small can, sprinkling the sand around the edge of the hole until it is level with the surface. Weigh remaining sand and subtract from original weight to obtain weight of sand in hole.

If the moisture corresponded to the curve from the laboratory and the fill had been rolled as required in the specifications it was considered to be compacted as required. The inspectors carried out a Proctor density test according to the procedure outlined in the soils manual.

Control during construction consisted of determining the moisture content and the degree of densification of the material being placed. The moisture contents were determined by packing the wet soil in the Proctor cylinder, weighing, measuring the resistance to penetration, and comparing these values with the wet weight and resistance to penetration curves for the particular sample. Checks on these values were made by oven drying small samples to determine the moisture contents more accurately. If the soils were found to be below the optimum moisture content they were sprinkled with water on the fill; if found to be above the optimum they were spread on the fill in thinner layers and allowed to dry either before rolling or during longer rolling periods.

The extent of consolidation was determined by measuring the resistance to penetration of the soil layer in place, and comparing these values with the readings obtained in the same soil compacted in the standard manner in the cylinder. If the plasticity needle readings of the soil layer were less than those for the soil in the cylinder, more rolling was required. This test was not used as extensively as the dry weight test because the presence of gravel in the material interfered with the needle.

Check tests on the degree of consolidation were made and accomplished in the following manner:

Approximately 15 pounds of the compacted soil were removed from the layer by a post hole auger, and weighed on a scale of approximately 30 pounds capacity. The same soil was then packed in the Proctor cylinder, weighed, and the density and moisture content computed as in the regular tests. The hole was filled with sand of a known loose weight per cubic foot and the volume computed. The wet and dry densities of the compacted material were determined from the weight, moisture content and volume. A comparison of the densities of the wet soil in place and the same soil compacted in the cylinder in the standard manner immediately indicated whether more rolling was required.

The calculation like the accompanying sample test was then carried out and the results compared with the curve.

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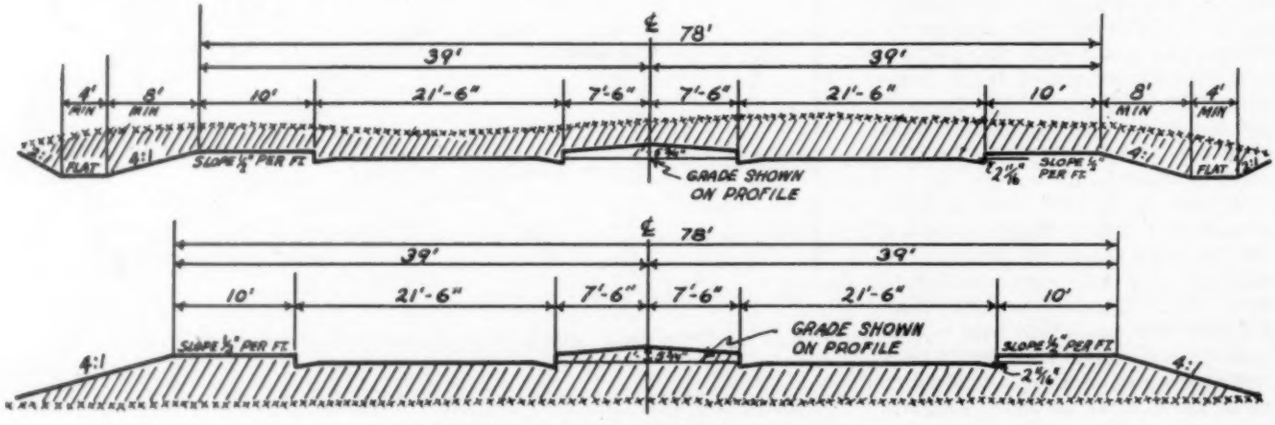
Equipment = Fairbanks scale—4 in. or 6 in. post-hole auger or sharpshooter shovel—air-tight containers—pans — dry sand passing No. 8 sieve—funnel for depositing sand.




Dual lane cross section design in cut and fill

The fills on this project range from 2 feet in height to 26 feet in height. There were several sloughs to be filled in but they caused no difficulty. The fill was started on the high side and the muck was pushed out on the low side. In each case the bottom was found to be hard and firm.

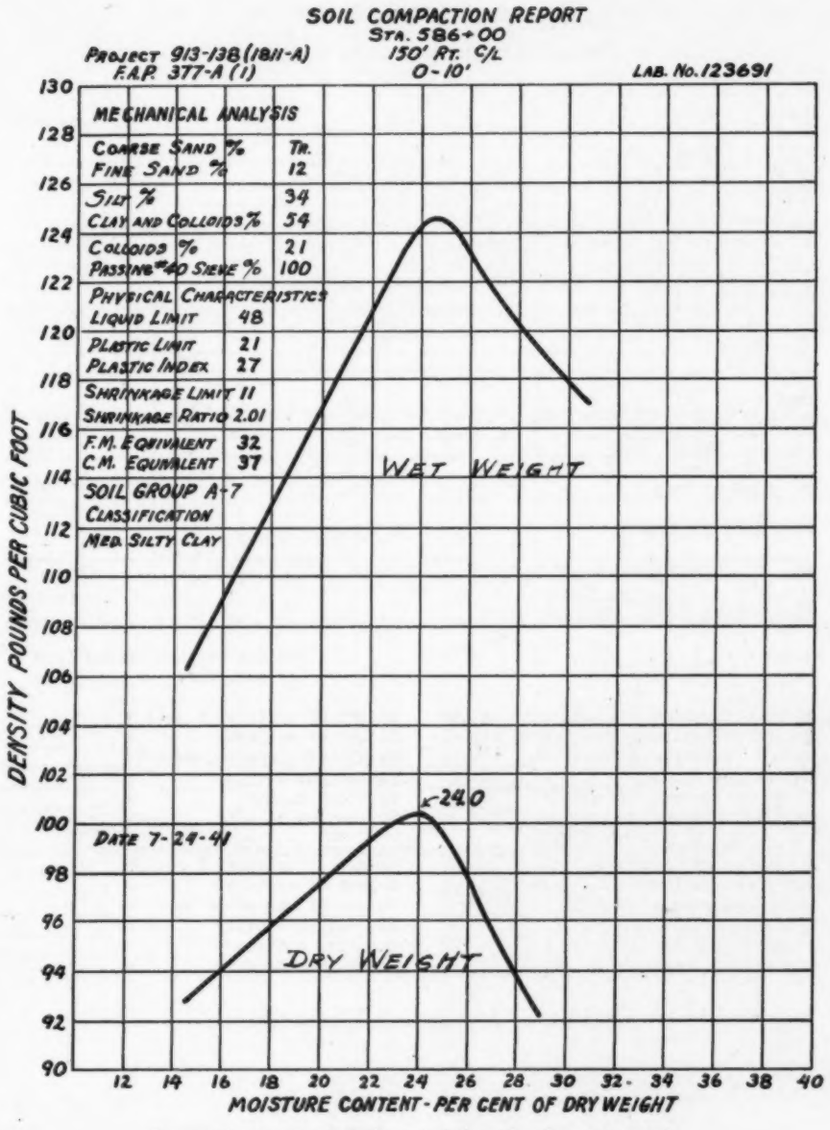
As stated previously the first 3½ miles was 78 feet, shoulder to shoulder, while the rest was 42 feet. The cross-sections shown give the slopes and other dimensions. *No deep roadside ditches were cut.*

All ditches, slopes and shoulders will be sodded after concrete is laid. The sod will begin at the edge of concrete and extend out all the way to the top of the backslope in both cuts and fills. Slab sod will be placed in all ditches having a grade of 2 percent or more.

### *Box Culverts*

The culvert work began as soon as the contractor could obtain steel. The first base was poured on August 18th and from that date the pouring was continuous. The culverts ranged in size from 3 ft by 2 ft. to 2-5 ft. by 5 ft. and in length from 45 feet to 188 feet. The sand and gravel used in all box culverts came from Gilmer Sand and Gravel Co., Minden, La., and was trucked over from that point. The cement used was from Arkansas Portland Cement Co. and shipped from Okay Junction, Ark. The reinforcing steel used came from Truscon Steel Co. All sand, gravel, cement and steel and water was sampled and approved for use by the testing laboratory in Baton Rouge. A trial mix was also furnished by the testing laboratory and each batch was weighed accurately before it was dumped into the mixer. The contractor used two Rex 2-bag mixers which were in perfect shape and no trouble at all was encountered. A foreman with 16 men excavated the bases, 1 foreman and 16 men followed this crew and poured the bases, 2 foremen with 20 men followed and set forms for walls and wings. Another foreman with 16 men followed and finished pouring the culverts. All material was bought by the contractor complete in place so the material was on the spot at each culvert's location. He trucked water. All culverts were finished by January 1, 1942. The total cubic yards amounted to 1400, the total steel was 172,271 pounds.

All small drainage areas were drained by installation of 24-in. reinforced concrete pipe. Concrete pipe will be used throughout the job. All side drains for driveways, local roads, etc., will be 24-in. reinforced concrete pipe.




Compaction curve and characteristics of soil encountered

LOUISIANA STATE HIGHWAY COMMISSION

REPORT OF EARTHWORK COMPACTION

Sand Displacement Method

Project 913-138 Date 8/8/41 Parish Caddo

| Date | Sta. | Lift No. | Lift Thickness | M.C. of Lift | Opt. Moist.% (Curve) | Maximum Density at Opt. Mois. From Curve | Dry Weight Density lbs. per Cu.Ft. in Fill | % Standard Compaction of Opt. Curve) |
|---|---|---|---|---|---|---|---|---|
| 8/8/41 | 454/00 | Second | 8 inches | 25.0 | 24.0 | 100.3 | 100.8 | 100.1 |

| Ref. Lab. Sample | Description of Soil | Description of Rolling | When Lift Placed | When Lift Completed | Temperature | Weather |
|---|---|---|---|---|---|---|
| 123691 | Clay | Sheepsfoot | 8/7/41 | 8/8/41 | | Cloudy. |

_____, Engineer

Report of compaction of embankments

LOUISIANA DEPARTMENT OF HIGHWAYS

Density and Moisture Content Work Sheet
(Sand Method)

Date: 8/8/41 Project No. 913-138

| | | Sample | | | |
|---|---|---|---|---|---|
| Station Tested 454-00 | | Calculation | | | |
| Station Hauled From | | 8/7/41 | | | |
| Date Layer Started | | | | | |
| Date Layer Completed | | | | | |
| Wt. of Sand in Container | A | 3.21 lb. | 3.30 | | |
| Volume of Container | B | 1.30 cu. ft. | | | |
| Wt. Per Cu. Ft. Sand A x 30 | C | 96.3 lb. | 99.0 | | |
| Wt. Wet Soil in Hole | D | 16.5 lb. | 6.6 | | |
| Wt. Wet Soil | | 100 gm. | 100 | | |
| Wt. Dry Soil | | 81 gm. | 80 | | |
| Wt. Water | | 19 gm. | 20 | | |
| %Moisture (19) - (81) | E | 23.46 | 25 | | |
| Wt. Dry Soil in Hole* | F | 13.37 lb. | 5.28 | | |
| Original Weight Sand | | 16.78 lb. | 19.4 | | |
| Final Wt. Sand | | 3.94 lb. | 14.2 | | |
| Wt. Sand in Hole | G | 12.84 lb. | 5.2 | | |
| Vol. Hole Cu. Ft. G / C | H | .1333 | .0525 | | |
| Wt. Cu. Ft. Soil in Hole** | K | 100.3 | 100.5 | | |
| %Compaction = K / Max. Dry Density*** x 100 | | | 100.1 | | |

Note: * = $\frac{(D)}{(100+E)}$ 100 ** F/H *** Max. density taken from Lab. curve

| | | | |
|---|---|---|---|
| Weight of cylinder & soil | 13.9 | Weight of cylinder & soil | |
| Weight of cylinder | 9.9 | Weight of cylinder | |
| Weight of compacted soil | 4.0 | Weight of compacted soil | |
| Wet weight Density | 112.0 | Wet weight Density | |
| Moisture Content | 25.0 | Moisture Content | |
| Dry weight Density | 93.3 | Dry weight Density | |
| Weight of cylinder & soil | | Weight of cylinder & soil | |
| Weight of cylinder | | Weight of cylinder | |
| Weight of compacted soil | | Weight of compacted soil | |
| Wet weight density | | Wet Weight Density | |
| Moisture Content | | Moisture Content | |
| Dry Weight Density | | Dry Weight Density | |

Method for determining compaction obtained

### *Miscellaneous*

A steel floodgate was installed on a 4 ft. by 3 ft. culvert at a crossing of the Texas and Pacific Railroad. This floodgate was furnished by Armco. Photo of same is herewith.

Springs were encountered in two cuts and will be taken care of by installing Armco perforated pipe which will be 6-in. in diameter. These pipes will be placed in back of the roadway ditch in a trench two feet wide, two feet deeper than normal grade line of ditch. This trench will be filled to a depth of 6 in. with coarse aggregate, the pipe placed with holes up and then the pipe will be completely covered with coarse aggregate. The pipe will be turned away from roadway ditch and the seepage emptied on rip rap about the right-of-way line. (See sketch.) The contractor was unable to get this perforated pipe promptly due to heavy defense orders but it has finally been delivered.

Scrapers working near a light tower

Compacting fill until feet ride out

Filling slough at end of 12-Mile Bayou bridge by pushing muck out with loaded fill and dump. Bulldozer pushes dirt over end

Before grading could be done in many places, several pipe lines had to be lowered and cased. These were placed two feet below the ditch grade.

A 66,000 volt high line had to be raised six feet and many telephone and telegraph lines had to be raised.

There will be constructed early in 1942 one 5-span concrete bridge. Each span will be 30 feet long and will be 26 feet wide. The construction will be deck and girder reinforced concrete spans and will rest on 14-inch reinforced concrete piling.

**LABOR USED TO JANUARY 1, 1942**

Administrative and Supervisory
8,577 hours ..... $ 7,048.27

Skilled
11,362 hours ..... 10,598.54

Intermediate
5,960.5 hours ..... 3,513.58

Unskilled
65,857 hours ..... 23,107.24

**LABOR RATES**

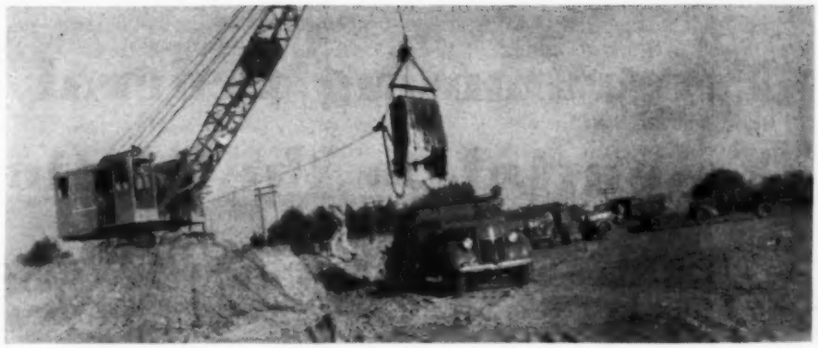
Common ..... $0.30 per hr.
Intermediate ..... .40 per hr.
Skilled ..... .75 per hr.

Work 40 hrs. per week with time and a half for overtime.
Total all labor 91,756.5 hours. $ 44,267.63
Total amount earned by contractor to January 1, 1942... 195,978.50

The work began promptly and continued smoothly without incident be-

cause of the contractor's carefully laid plans and their efficient execution by an experienced organization. Dave Greenwald, superintendent, a partner in the contracting company, had charge of the work. All of his foremen and many of his men have been working for Central Construction Company for fifteen years or more and are unusually loyal to their employer. On this job it showed up when work started on the big shell loading plant at Meriden, Alabama. Most of the tractor drivers quit and went over to the bigger project. However, before new skinners could be hired the old crew was back on the job at Shreveport.

Herewith is a table of contract bid items and prices:



One of draglines loading trucks in borrow pit

### *Engineering Force*

Mr. W. Prescott Foster, Director of Highways.

Mr. Harry B. Henderlite, State Highway Engineer.

Mr. R. B. Richardson, Construction and Maintenance Engineer.

Mr. L. S. Lenoir, District Engineer.

Mr. R. H. Vaughn, District Construction Engineer.

Mr. E. M. Gillen, Resident Engineer in charge of construction.

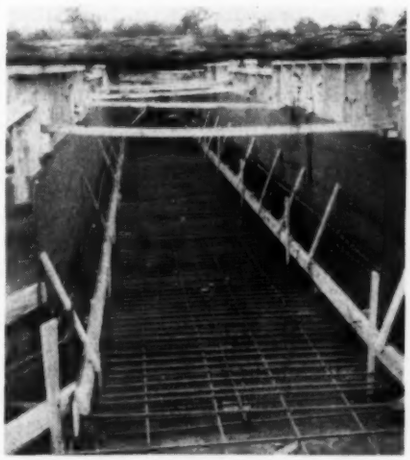
Mr. J. H. Nickelson, Inst. Man.

Mr. Dave Greenwald in charge of construction for Central Construction Company.

This project is financed with state and federal aid funds and is inspected each month by the Public Roads Administration engineer.

TABLE OF ITEMS AND BID PRICES

| Item | Unit | Quantity | Price | Amount |
|---|---|---|---|---|
| Clearing | Acres | 59.337 | $ 65.00 | $ 3,856.90 |
| Grubbing | Acres | 36.000 | 85.00 | 3,060.00 |
| Common excavation | Cu. Yds. | 244,984 | .22 | 53,896.48 |
| Drainage excavation | Cu. Yds. | 23,000 | .25 | 5,750.00 |
| Special borrow exc. | Cu. Yds. | 300,555 | .32 | 96,177.60 |
| Overhaul on exc. | Sta. Yds. | 319,480 | .01 | 3,194.80 |
| Tuft sodding | Sq. Yds. | 321,344 | .05 | 16,067.20 |
| Slab sodding | Sq. Yds. | 38,118 | .24 | 9,148.32 |
| Sand-clay-gravel (For intersecting Roads) | Cu. Yds. | 291 | 2.50 | 727.50 |
| Portland cement conc. paving (21.5 ft. by 9-in.-6 in.-9 in. | Sq. Yds. | 81,138.5 | 1.65 | 133,878.52 |
| Portland cement conc. paving (22 ft. by 9 in-6 in.-9 in.) | Sq. Yd. | 41,661.7 | 1.65 | 68,741.80 |
| Port. cem. conc. paving (8 in. uniform) | Sq. Yd. | 7,592.7 | 2.00 | 15,185.40 |
| Mud pump connections | Each | 100 | .50 | 50.00 |
| Metal parting strip | Lin. Ft. | 52,070 | .125 | 6,508.75 |
| Expansion joint filler | Sq. Ft. | 5,380 | .25 | 1,345.00 |
| Asphalt mineral filler | Ton | 16.000 | 60.00 | 960.00 |
| Dowel assembly | Lin. Ft. | 57.948 | .18 | 10,430.64 |
| Class "A" concrete | Cu. Yd. | 1,828.10 | 24.00 | 43,874.40 |
| Deformed reinf. steel | Pound | 252,965 | .0475 | 12,015.83 |
| Fabric reinf. | Pound | 435,288 | .05 | 21,764.40 |
| Fabricated carbon steel | Pound | 9,376 | .20 | 1,875.20 |
| 18 in. reinforced concrete pipe | Lin. Ft. | 486 | 2.00 | 972.00 |
| 24 in. reinf. conc. pipe | Lin. Ft. | 759 | 3.00 | 2,277.00 |
| Commercial fertilizer for sod | Pound | 37,200 | .03 | 1,116.00 |
| 14 in. precast conc. pile | Lin. Ft. | 740 | 4.00 | 2,960.00 |
| 16 in. precast conc. pile | Lin. Ft. | 400 | 4.50 | 1,800.00 |
| Loading test pile (14 in. by 35 ft. long) | Each | 1 | 150.00 | 150.00 |
| Unloaded test pile (14 in. by 35 ft. long) | Each | 1 | 250.00 | 250.00 |
| New barbed wire fence | Sta. | 564.02 | 7.00 | 3,948.14 |
| New combination fence | Sta. | 3.95 | 15.00 | 59.25 |
| Rebuilt fence | Sta. | 19.25 | 5.00 | 96.25 |
| New fence posts | Each | 150 | .40 | 60.00 |
| Single plank gates | Each | 72 | 15.00 | 1,080.00 |
| Project markers | Each | 3 | 25.00 | 75.00 |
| Right-of-way markers | Each | 139 | 2.00 | 278.00 |
| Sacked concrete revetments | Cu. Yd. | 100 | 15.00 | 1,500.00 |
| Integral conc. curb | Lin. Ft. | 35,489.7 | .12 | 4,258.76 |
| Steel plate R. R. crossing | Sq. Ft. | 732.2 | 4.50 | 3,294.90 |
| Stop signs | Each | 3 | 30.00 | 90.00 |
| Slow signs | Each | 1 | 20.00 | 20.00 |
| Caution signs | Each | 8 | 20.00 | 160.00 |
| Railroad warning sign | Each | 6 | 25.00 | 150.00 |
| Railroad crossing sign | Each | 6 | 65.00 | 390.00 |
| Destination sign | Each | 1 | 20.00 | 20.00 |
| Timber sign board | Each | 1 | 250.00 | 250.00 |
| Transplanting fruit trees | Each | 14 | 5.00 | 70.00 |
| Installing reflector assembly | Each | 150 | .90 | 135.00 |
| Steel sluice gate | Each | 1 | 225.00 | 225.00 |
| 6 in. perforated pipe | Lin. Ft. | 110 | 2.50 | 253.00 |
| Red pigmented dust coat for pavement slab | Sq. Yd. | 584.9 | .70 | 409.43 |
| Black pigmented dust coat for pavement slab | Sq. Yd. | 5.1 | 1.00 | 5.10 |
| 11 various bldgs., structs, etc., to be moved from R/W | Each | 11 | Var. | 575.00 |
| Total amount of contractor's bid | | | | $535,436.57 |



Culvert bottom ready for concrete. Extra steel used because of 188 ft. length

Culvert crew pouring concrete

Floodgate on 4 ft. by 3 ft. culvert

# Programming Federal Aid Projects Essential to the National Defense

A RECENT administrative order of the Public Roads Administration establishes the procedure for obtaining certification of highway projects as essential to the national defense. By a previous order dated December 2 all highway projects involving federal aid funds, secondary federal aid funds and grade-crossing funds which had not been previously authorized for advertisement were stopped. It is therefore now necessary to resubmit projects for certification as to their defense importance.

Following are the instructions issued by the Public Roads Administration on procedure for such certification:

(1) All projects contained in approved programs for regular Federal-aid funds, secondary Federal-aid funds and grade crossing Federal-aid funds for which plans, specifications and estimates were not recommended for approval and authorization for advertisement issued prior to the receipt of the stoppage order of December 2, immediately lose all program status and must be resubmitted and certification obtained as essential to the national defense before they can be approved for improvement with Federal funds.

(2) The procedure regarding programs of proposed construction outlined in Regulation 4. Section 1, of the rules and regulations for carrying out the provisions of the Federal Highway Act shall be considered as satisfied by the submission and consideration of individual projects which are accompanied by letter-size insert maps indicating the location of the proposed work. This shall remain in force as long as the above restrictions apply.

(3) To accomplish defense certification of projects, each project proposed for programming shall be submitted on special forms prepared for this purpose. * * * All of the information called for on this form shall be supplied in sufficient detail to afford a basis for judgment as to the defense character of the project. When the proposed work is already covered by approved project statements the project shall be designated by the appropriate project and section number with necessary prefixes. When the proposed work is not already covered by approved project statement a new project number shall be assigned and appropriate section designation given. The certification of individual project submissions shall constitute program approval after which established Federal-aid procedure shall apply supplemented by any necessary applications for preference ratings for critical materials required for the work. The information given in the "Request for Program Approval" descriptive of the proposed work, of existing facilities that will be corrected and the traffic service rendered, if properly presented, can be used to support applications for preference rating orders.

## New Priorities Procedure Announced

A GENERAL administrative memorandum by the Public Roads Administration, dated December 29, 1941, made public an order of the Division of Priorities, Office of Production Management, which supersedes the original order establishing priority ratings for various classifications of highway work. This new order outlining the procedure to be followed, as well as the schedule setting forth the assignable priority ratings for various classifications of work, is set forth in full hereafter.

OFFICE OF PRODUCTION MANAGEMENT
DIVISION OF PRIORITIES
DIVISION ADMINISTRATIVE ORDER No. 12

Describing procedure available to the Public Roads Administration, the several State highway departments and local government agencies for obtaining preference ratings for materials and equipment necessary for the construction of certain classes of highway projects.

WHEREAS, it is deemed important to the national defense to expedite the construction of certain highway projects administered by the Public Roads Administration, the several State highway departments or local government agencies particularly if said projects conform to the classes hereinafter described; and

WHEREAS, E. R. Stettinius, Jr., as Director of Priorities, by letter dated August 30, 1941, to Thomas H. MacDonald, Commissioner, Public Roads Administration, authorized said Administration and the several State highway departments to indicate to prospective contractors and suppliers the possibility of obtaining preference ratings when necessary covering deliveries of material and equipment necessary for the construction of specified classes of highway projects and created a procedure for applying for such ratings; and

WHEREAS, by reason of the present state of War it is desirable to terminate the provisions of said letter of August 30, 1941, and to substitute amended provisions in lieu thereof,

NOW THEREFORE, by virtue of the authority vested in him by Regulation No. 3 Amended dated September 2, 1941, and approved by the President September 12, 1941, the Director of Priorities hereby orders that

I. Said letter of August 30, 1941, is superseded by this Order;

II. Preference ratings will be assigned to deliveries of material and equipment necessary for the completion of highway projects administered by the Public Roads Administration, the several State highway departments or local Government agencies, such as municipalities, counties, townships or rural districts, (hereinafter referred to as a "department") upon the following terms and conditions:

(1) Deliveries of material and equipment necessary for the completion of any project conforming to one of the classes set forth in Schedule A attached to this Order and made a part hereof (hereinafter referred to as a "classified project") shall be assigned the appropriate rating specified in said Schedule A,

when the application as filed conforms to the provisions of Section II (4) hereof;

(2) Deliveries of material and equipment necessary for the completion of any project other than a classified project (hereinafter referred to as an "unclassified project") shall be assigned such rating as the Director of Priorities deems proper when in his opinion the application filed pursuant to Section II (5) hereof justifies priority assistance;

(3) Each application for the assignment of a preference rating necessary for the completion of any project shall be made to the Division of Priorities, Office of Production Management, by either the Public Roads Administration or by the interested department through the Public Roads Administration depending upon which agency is responsible for the administration of the project;

(4) Each application in connection with a classified project shall set forth such information as may be required by the Director of Priorities to establish that the project is a classified project and that it has been certified as essential to the national defense by the appropriate Federal defense agency, and also to establish the kind and quantity of critical materials to which the assignment of a preference rating is necessary to obtain deliveries on schedule;

(5) Each application in connection with an unclassified project shall set forth such information as may be required by the Director of Priorities to establish that the project is essential to the national defense or to the health and safety of the public, and to establish the kind and quantity of critical materials to which the assignment of a preference rating is necessary to obtain deliveries on schedule;

(6) The Public Roads Administration, and each department which is issued a preference rating pursuant to this Order shall file such reports with said Division of Priorities as may be required from time to time by the Director of Priorities;

(7) This order shall take effect immediately and unless sooner revoked shall expire on December 31, 1942.

(Signed) J. S. Knowlson
Acting Director of Priorities
December 19, 1941

# Preference Rating Procedure Applying to Highway Projects

SCHEDULE A

| Class of Projects | Preference Rating |
|---|---|
| 1. Access Road Projects Certified as Essential to the National Defense: | |
| a. Access Roads to Military, Naval or Defense Manufacturing Establishments. | Preference Rating of the Access Road Project shall correspond to the rating of the military, naval or defense manufacturing establishment served except that the highest rating which can be assigned is A-1-e. |
| 2. Certified Projects for the Correction of Critical Deficiencies of the Strategic Network of Highways and such other Highway Projects as are Certified as Essential to the National Defense: | |
| a. All bridges, tunnels, structures and approaches, other than highway or railroad grade separation structures. | A-2 |
| b. All other major construction projects including grading, surfacing, and highway and railroad grade separation structures. | A-4 |
| c. Minor construction projects including shoulder widening and minor drainage structures. | A-10 |

PROCEDURE available to the Public Roads Administration, the several State highway departments and local government agencies for obtaining preference ratings for materials and equipment necessary for the construction of certain classes of highway projects was taken from Public Roads Administration, G.A.M. No. 148. This procedure supersedes the procedure which was based upon the previous authority provided by a letter of intention dated August 30, 1941, from the Director of Priorities to the Commissioner, Public Roads Administration.

Priorities Division Administrative Order No. 12 classifies highway projects and indicates the preference ratings which will be assigned to projects conforming to each of these classes when such projects have previously been certified as essential to the national defense by the appropriate Federal defense agency. Such certified projects are referred to in this Order as "classified" projects. All other projects are referred to as "unclassified" projects. An unclassified project, provided it is deemed by the Director of Priorities to be sufficiently important to the national defense or to be essential to the health and safety of the civilian population, will receive such preference rating as the Director of Priorities determines to be appropriate.

Application for a preference rating should be made only: (1) When the work is essential to the national defense or to the health and safety of the civilian population; and (2) for critical materials which are indispensable and for which non-critical materials cannot be substituted. Unless the application clearly demonstrates that these two requirements are fulfilled, it will not be considered favorably by the Division of Priorities, Office of Production Management. Applications should not be made for proposed work which may represent a desirable improvement but which cannot be considered essential. When only a few individual purchases of critical materials will be required for the construction of a project, application should be made on the general application form PD-1 of the Division of Priorities, Office of Production Management.

### *Form of Application*

All applications for highway project preference ratings, whether for classified or unclassified projects, shall consist of a "Summary" sheet, made out in accordance with the attached form, supported by a complete statement describing the necessity for the work and the necessity for the critical materials.

The Summary should be completed by the applicant except for spaces reserved for "Application Number" and "Recommendation of District Engineer, Public Roads Administration." The "Official Title of Department" should be the official name of the agency responsible for the construction of the project and to which the preference rating order or certificate should be addressed.

Under "Project Number" enter the Public Roads Administration project designation, if any; otherwise enter the State project number, the contract number or any other similar identifying number which is customarily used by the applicant. In cases where projects will be identified by name without any identifying number, the name of the project should be inserted in this space.

The "Location of Project" should identify the road or street on which the project is located by route number or by name and should definitely locate the beginning and end of the project. Under "Type" describe the nature of the construction work proposed such as grading and draining, Portland cement concrete pavement, reinforced concrete T-beam bridge and approaches, etc. "Length" should be recorded in miles and decimals of a mile.

Under "Present Status of Project," for projects not yet under construction enter the date the contract was awarded, or the date bids will be opened. For projects under construction, enter the percentage of completion. "Estimated Completion Date" is the date on which it is expected that the project will have been completed and all of the critical materials listed in the application will have been obtained.

Under "Purchase of Critical Materials" place a check mark after "By contractor" if all the materials will be purchased by the contractor. If all or any of the materials necessary for the project are to be purchased by the department directly, place a check mark after "By Department."

Attach to the Summary sheet a statement entitled "Present Necessity of Proposed Work," divided into three sections subtitled: (1) Description of proposed work (2) Description of existing highway or structure (3) Traffic service.

APPLICATION FOR HIGHWAY PROJECT
PREFERENCE RATING ORDER
SUMMARY

State:_____

Application No.:_____

Submitted_____, by:
(Date)

_____ _____
(Official title of Department) (Name of Officer)

_____ _____
(Address) (Title)

Project Number:_____

Location of project:_____

_____

Type:_____Length:_____Average daily traffic:_____

Present status of project:_____

Estimated completion date:_____

Total cost:_____Cost of critical materials:_____

Purchase of critical materials: By contractor_____By Department_____

_____

Recommendation of District Engineer, Public Roads Administration:

_____
(Signature)

_____
(Date)

Under "Traffic Service" state clearly and completely the traffic conditions for which existing facilities are inadequate. This statement should indicate the average traffic volume on existing facilities, and the volume and frequency of peak traffic flows if this is an important factor in the particular case. The character of the traffic should also be indicated, especially the amount of heavy industrial traffic. If the proposed project will reduce or eliminate a serious hazard, this fact should be substantiated by a statement of the accident record and a specific explanation of the hazards to be eliminated. If the project has a definite and direct relation to the national defense, this relationship should be clearly described; but claims of defense importance should not be made for projects which have only the general importance to the national economy and defense that may be attributed to almost any desirable improvement.

It is essential that all statements in support of the necessity for proposed work be *factual* statements expressed in *specific* terms. A road should not be described as "narrow" nor a bridge as "weak." Widths and clearances should be expressed in feet, and bridge capacities in terms of the maximum safe load in tons. Traffic volume should not be described as "heavy" or "large" but should be stated in terms of vehicles per day or per hour. In many cases a map or chart showing the relationship of the proposed project to the existing highway net will be helpful.

In addition to the statement justifying the present necessity of the proposed work, there must be attached to every application an itemized list of critical materials for which preference rating assistance will be

necessary together with a statement headed "Necessity for Critical Materials." Under this heading state why the design selected for the proposed project involves a minimum use of critical materials and why the materials listed are essential to that design. The list of critical materials should be prepared in the form of a tabulation indicating the type and quantity of critical material required, and the estimated cost. Attached is a list of critical materials which may be used in highway construction. Items shown in the attached list are not to be construed as those which will automatically be considered essential in any highway project. Noncritical materials can readily be substituted on most highway projects. Reinforced concrete structures, for example, can frequently be used instead of steel structures; mass concrete can in many cases be substituted for reinforced concrete; and plain cement concrete pavement or other pavement types can be substituted for reinforced concrete pavement. Only special conditions will justify a preference rating for such items as pavement reinforcing, metal culvert pipe, steel guardrail, and items of bronze, brass or copper.

In the case of projects under construction, list only the quantity of critical materials necessary to complete the project. Do not include the quantity of critical materials already delivered.

### *Method of Submission*

*Federal-aid Highway Projects.*—All apportionments of Federal-aid funds heretofore made before the end of the calendar year 1941 are restricted to projects essential to the national defense as certified by the appropriate Federal defense agency. All projects contained in approved programs for regular Federal-aid funds, secondary Federal-aid funds and grade crossing Federal-aid funds for which plans, specifications and estimates were not recommended for approval and authorization for advertisement issued prior to the receipt of the stoppage order of December 2, immediately lose all program status and must be resubmitted and certification obtained as essential to the national defense before they can be approved for improvement with Federal funds. The new procedure for programming Federal-aid projects essential to the national defense in accordance with this requirement is described in General Administrative Memorandum No. 144 of the Public Roads Administration, dated December 29, 1941. (See preceding pages.)

When a project is certified and programmed, application for priority assistance should be submitted through the District Engineer of the Public Roads Administration as soon as it is possible to determine the critical materials which will be necessary. This application should consist of the Summary and the list of critical materials together with the statement justifying the necessity for these materials. It will *not* be necessary to include the statement describing the necessity for the proposed work because this statement in the same detail described above under *Form of Application* must already have been incorporated in the form "Request for Program Approval, Federal-aid Project Essential to the National Defense" submitted in accordance with General Administrative Memorandum No. 144. A copy of this form and the defense certification will be attached to the priority application and submitted to the Office of Production Management by the Washington office of the Public Roads Administration.

Such a project is a classified project in accordance with Schedule A of Priorities Division Administrative Order No. 12. In forwarding the application for priority, therefore, the District Engineer of the Public Roads Administration will indicate on the Summary sheet, in the space reserved for his recommendation, the classification of the project in accordance with Schedule A and the corresponding preference rating which applies. All such applications for classified projects should be submitted to the Washington office of the Public Roads Administration in duplicate.

If priority assistance has not already been obtained for Federal-aid projects not subject to the stoppage order of December 2, applications should be submitted in the complete form described above under *Form of Application.* When a project which has been approved prior to December 2 satisfies the requirements with regard to defense importance which apply to all Federal-aid projects approved after December 2, the District Engineer should indicate this fact in the space reserved for his recommendation on the Summary sheet of the application together with the Classification and appropriate rating of the project in accordance with Schedule A. If defense certification is obtained, the project becomes a classified project. Federal-aid projects approved prior to December 2 which are not essential to the national defense will be considered unclassified projects under Priorities Division Administrative Order No. 12.

*Highway Projects Other Than Federal-aid Projects.*—Priorities Division Administrative Order No. 12, Section II (3), provides that each application for *preference rating assistance for any highway project* to be undertaken by a *State highway department* or a local government agency such as a *municipality, county, township* or *rural district, shall be submitted to the Division of Priorities,* Office of Production Management, *through the Public Roads Administration.* This provision does not apply to projects financed in whole or in part by the Work Projects Administration. A priorities procedure has been established which applies to all WPA projects including highway projects. The sponsor of a WPA project should make inquiry of the Work Projects Administration for information concerning priority assistance.

The provision that applications for priority assistance for highway projects (other than WPA projects) be submitted through the Public Roads Administration involves no delegation of authority in connection with priorities by the Office of Production Management to the Public Roads Administration. The Office of Production Management desires the assistance and advice of the Public Roads Administration in all highway applications for priority assistance. In providing this service, the Public Roads Administration has in turn requested and obtained the assistance of the several State highway departments. In order that the comment and advice of the State highway department and of the field organization of the Public Roads Administration may be supplied conveniently and expeditiously, applications for priority assistance by the State highway department for projects financed wholly with State funds should be transmitted to the District Engineer of the Public Roads Administration. Applications for municipal, county or other local highway projects should be submitted to the State highway department. If, in the opinion of the State highway department, the project is essential to the national defense, or to the health and safety of the civilian population, it will forward the application with such recommendation to the District Engineer.

When the District Engineer is satisfied that a proposal is essential to the national defense, he will recommend the project for defense certification, and will indicate the classification of the project according to Schedule A. If defense certification is obtained, the project becomes a classified project under Division Administrative Order No. 12. Otherwise, the project is an unclassified project.

If the State highway department cannot recommend the project, it will forward the application without

recommendation. Neither the State highway department nor the Public Roads Administration has authority to disapprove an application, and all properly prepared applications submitted in accordance with this procedure will be transmitted to the Division of Priorities, Office of Production Management. However, the Public Roads Administration will not recommend any project for priority assistance unless the application clearly demonstrates that the project is essential, that a minimum of critical materials will be used, and unless the application is accompanied by the favorable recommendation of the State highway department and the District Engineer of the Public Roads Administration.

All applications for project preference rating should be submitted to the Washington office of the Public Roads Administration in duplicate.

### *Project Preference Rating Order P-19-e*

When an application for priority assistance is approved by the Division of Priorities, Office of Production Management, a Project Preference Rating Order is issued to the applicant. The P-19-e project rating order form will be used for all highway projects. "Department" is defined as the Federal, State or Territorial agency to which the Order is addressed. It will also mean the municipality, county or other local governmental agency to whom such an Order is addressed.

The Order as printed applies particularly to projects undertaken by the "contract" method. However, when the application for priority assistance indicates that critical materials will be purchased by the Department, the Order will be modified to provide for the assignment of the preference rating to such purchases.

It is not necessary for the Department to sign and return an acceptance of this Order to the Office of Production Management, nor is it necessary for the Department to sign the acceptance before serving on a Supplier. If a Supplier finds it necessary to apply the preference rating to deliveries to him of *materials to be physically incorporated into the project*, he must first execute a copy of the Order by signing the acceptance sheet and forwarding this sheet only to the Division of Priorities, Office of Production Management, Washington, D. C.; and second, accompany his purchase order to his Supplier with a copy of the Order with a signed acceptance.

This Order may be applied only *by the Department* to deliveries of Materials to a Contractor; or by a Supplier to deliveries to that Supplier, as defined in the Order. Contractors shall submit to the Department two copies of all purchase orders for Materials (as defined in the Order) on which priority assistance is necessary.

The Department will forward one copy of the purchase order to the Supplier together with a copy of the Preference Rating Order if the desired Material is essential to the completion of the project. It will not be necessary for the Department to serve more than one copy of the Order on a particular Supplier, but subsequent purchase orders from the Contractor on the project to that Supplier must be endorsed *by the Department* (not the Contractor) with the serial number of the Order and the date it was first served on that Supplier.

Restrictions on the use of the Rating Order are described in paragraph (e). The preference rating cannot be applied to the delivery of Material which can be secured without the preference rating. It should be noted that, under this provision, copies of the Preference Rating Order *cannot* be extended to *Suppliers* to cover critical Materials delivered to a project prior to the issuance of the Preference Rating Order.

Although *the P-19-e Order* may be used by the Department to obtain delivery of any required Material to the Contractor, it *may not be used by a Supplier to obtain delivery of Materials to him that will not be physically incorporated into the project*. This means that the Department may use the Order to obtain delivery of repair parts and of new equipment to the Contractor but that a Supplier cannot use the Order to obtain repair parts or new machinery with which to process or manufacture Materials which are to be incorporated in the project. However, the *Order may be used to cover purchases of new equipment by contractors only if such equipment is not available by leasing, renting, or otherwise on a temporary basis*. Furthermore *the Contractor*, in requesting the department to use the Order in obtaining new equipment for him, *must certify* to the Department in writing his *inability to rent or lease such equipment* or otherwise obtain it on a temporary basis. The Department must be particularly careful in applying the Order to the purchase of new equipment. Under no circumstances should the Order be used to fully equip a Contractor. Its use in this respect is *intended to provide the few essential pieces of equipment* which may be required for the particular project by an otherwise *well-equipped Contractor*.

When it is necessary to use the Order to obtain *delivery to a Contractor of new equipment or repair parts, or other Material* that will *not be physically incorporated* into the project, the *Contractor should be requested to place his order with the producer or manufacturer* because the *rating assigned* by the Order is not *extendible* by the Supplier of such Material. A Contractor's *purchase order* may be *placed with the manufacturer through a local distributor*.

Preference Rating Order P-19-e describes the reports and records that must be kept by the Department and all suppliers making use of the Order. Forms PD-81 and PD-81-Following Sheet, are to be used in reporting each month to the Division of Priorities on the use of the Order. (Copies of the forms as well as Preference Rating Order P-19-e are available through Priorities Division field offices.) These forms may be reproduced by the Department and the Suppliers. Monthly reports by the Department should be submitted through the District Engineer of the Public Roads Administration, and those by the Suppliers direct to the Priorities Division. Reports from Departments should be transmitted in duplicate to the Washington office of the Public Roads Administration.

The list of critical materials attached to the Summary sheet as part of the application should be prepared in the form of a tabulation with headings as follows:

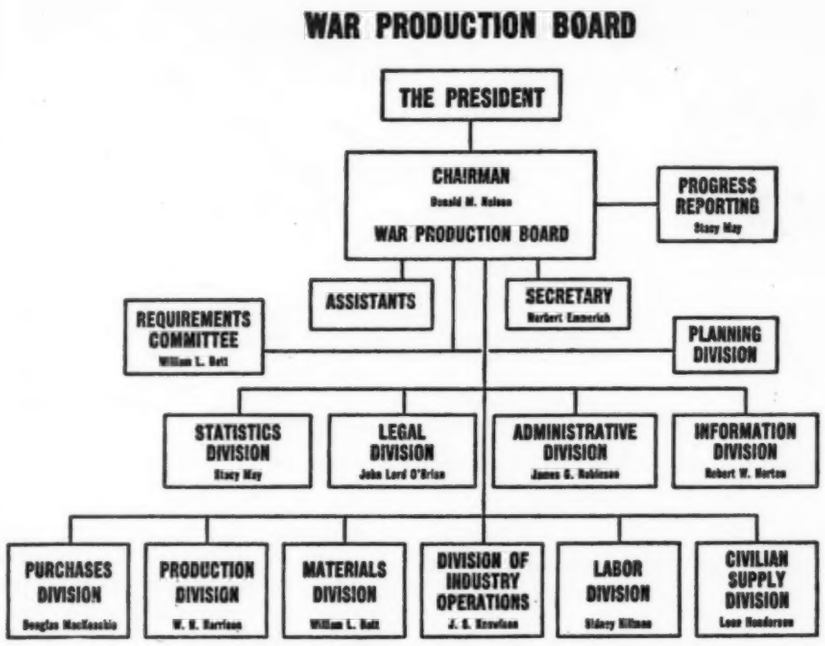
| Critical Materials for Which Priority Assistance is Necessary | | |
|---|---|---|
| Material | Quantity | Estimated Cost |

In this tabulation include any of the materials in the following list needed to complete the project. The entire following list need not be reproduced.

| IRON AND STEEL [1] | Unit | NONFERROUS METALS | Unit |
|---|---|---|---|
| Structural steel, plates | Tons | Bronze | Lbs. |
| Structural steel, other shapes | Tons | Brass | Lbs. |
| Reinforcing steel, bars | Tons | Copper | Lbs. |
| Reinforcing steel, wire mesh | Tons | Lead | Lbs. |
| Forgings | Tons | | |
| Castings | Tons | | |
| Sheet piling | Tons | ELECTRICAL EQUIPMENT | |
| Wire cable | Lbs. | and SUPPLIES | |
| Nails | Lbs. | | |
| Metal pipe (indicate type) | Lbs. | FIXED MACHINERY | |
| Other iron and steel, identify | Lbs. | | |

Other materials for which priority assistance will be required.

[1] List alloy steels separately from carbon steel.




*Organization under War Production Board, January 20*

The organization under the new War Production Board, absorbing the functions of the Office of Production Management, is indicated in diagramatic form herewith. There will probably be a seventh primary division in addition to purchases, production, materials, industry operations, labor, and civilian supply. It will have to do with the relationships of the field organizations to the problem of getting the job done. To get a smooth, working relationship with industry and to get as much conversion as possible of an industry, for war production work, as quickly as possible, a Division of Industry Operations has been set up. They will get results by working with the Production Division, with the Purchases Division, and with the corresponding people in the Army and Navy. They will work with the Civilian Supply Division to bring about such curtailments as may be necessary in the industry and they will work with the Labor Division to see that the interests of labor are represented in these conversions and other operations of industry.

As to the relationship between the Division of Industry Operations and the Production Division, Mr. Donald M. Nelson, in an interview, stated: "There will be, for each industry, a committee picked and cleared through our Clearance Committee for committees. There will also be a Committee of Labor for that industry picked in the Labor Division, and the two will come together at any time you are thinking of. They will discuss anything in terms of the things that both management and labor are interested in in production. They will handle the problems.

"There will be a man in charge of each one of the important industries just as in the automobile industry. Mr. Harrison over here, who is working with the armed services constantly, knowing what they need in things to finish out a program, whether it be more airplane struts, more carburetors, more hydraulic devices, and so forth, will come over to the Division of Industry Operations if he doesn't know of a factory that can do it, and he will sit down and talk it over with Mr. Knowlson. They will call in the industries that they feel have the possibilities, from a knowledge of the industry the branch chief has of the machinery of that industry and what it has been making and what it could make, and will act with Mr. Harrison in seeing about bringing right to him sources of supply that can do that particular job of meeting that bottleneck situation, whatever it may be, that he has."

Shown below is a tabular setup of the Office for Emergency Management which the President established to work out national emergency problems connected with our war effort. The organization has changed from time to time. This is as of Jan. 27, 1942:

OFFICE FOR
EMERGENCY MANAGEMENT
Wayne Coy, Liaison Officer

Central Administrative Services: Dallas Dort, Director.

Defense Communications Board: James Lawrence Fly, Chairman.

Defense Housing Division: C. F. Palmer, Coordinator.

Information Division: Robert W. Horton, Director.

National War Labor Board: Wm. H. Davis, Chairman.

Office of Scientific Research and Development: Dr. Vannevar Bush, Director.

Office of Civilian Defense: Fiorello H. LaGuardia, Director.

Office of the Coordinator of Inter-American Affairs: Nelson Rockefeller, Coordinator.

Office of Defense Health and Welfare Services: Paul V. McNutt, Director.

Office of Defense Transportation: Joseph B. Eastman, Director.

Office of Facts and Figures: Archibald MacLeish, Director.

Office of Lend-Lease Administration: E. R. Stettinius, Jr., Administrator.

Office of Price Administration: Leon Henderson, Administrator.
- Consumer Division: Leon Henderson, Administrator; Dan A. West, Deputy Director.

War Production Board:
- Donald M. Nelson, Chairman.
- Henry L. Stimson.
- Frank Knox.
- Jesse H. Jones.
- William S. Knudsen.
- Sidney Hillman.
- Leon Henderson.
- Henry A. Wallace.
- Harry Hopkins.

War Production Board Divisions:
- Donald M. Nelson, Chairman.
- Herbert Emmerich, Secretary.
- Purchases Division: Douglas MacKeachie, Director.
- Production Division: W. H. Harrison, Director.
- Materials Division: Wm. L. Batt, Director.
- Division of Industry Operations: J. S. Knowlson, Director.
- Labor Division: Sidney Hillman, Director.
- Civilian Supply Division: Leon Henderson, Director.
- Progress Reporting: Stacy May, Chief.
- Requirements Committee: Wm. L. Batt, Chief.
- Statistics Division: Stacy May, Chief.
- Information Division: Robert W. Horton, Director.
- Legal Division: John Lord O'Brian, General Counsel.

## Minnesota Highways Have 8,605 Bridges

An inventory made by the Minnesota Highway Planning Survey, based on field surveys in 1936 and 1937, of all bridges on all rural roads and urban extensions, lists 8,605 bridges of more than 20-ft. span. There were 1,420 bridges on state trunk highways, 1,497 on state aid roads, 1,573 on county aid roads, and 4,115 on township and other local roads. Bridges on local municipal streets were not included. Of the total 794 bridges were reported in poor condition, 1,796 fair and 6,015 good. There were 2,133 bridges less than 16 ft. wide, 4,769 were 16 to 19 ft., 738 were 20 to 23 ft. and 965 were 24 ft. wide or wider.

# OBSERVATIONS BY THE WAY

By
**A. PUDDLE JUMPER**

¶ An automobile is legally defined as a wagon in Montana and, as such, is exempt under state laws from attachment for debt.

• •

¶ Fuel oil furnace heats bituminous pavement surface just ahead of cutting edge of blade of specially built grader for removing bumps, uneven-

ness and corrugations. Planed off material spills off end of cutting edge in small windrow. It works!

• •

¶ W. L. Cobb Construction Company, Decatur, Georgia, have the contract for 7 miles of blacktop resurfacing on U. S. 17 at Hardeville, S. C., near Savannah, Ga. The old road was 18 ft. wide and constructed of concrete, and this Adams diesel motor grader has been used on the grading, spreading, and blading of a new 3-in. plant-mix asphalt surface. This picture shows a home-made finisher chained to the motorgrader mold-

board to obtain a 4 to 1 slope beyond an 8½ ft. shoulder, due to the inability of the grader to get into the ditch where the marshy, mucky ground would cause the motorgrader to bog down.

• •

¶ Next morning after the New Year's Day storm in Iowa, where I was snowbound in a big drift along the road, I had the car towed into Montour. Oscar Tenhamm, Director of Highways of Chile, and I imposed upon the hospitality of local townsmen for beds that night (there is no hotel in the town) after tramping a mile through belly deep drifts and a cutting north wind to get to town. The storm proved to be the worst in 55 years in that area—24 in. of snow on the level and, most of it in drifts.

After digging the snow out from under the hood, drying off the coil and distributor wires, and cleaning it off the body of the car, I stepped on the starter and—surprise!—it started. Sr. Tenhamm took my picture (and I took his) just before we headed back to Chicago after the plows had broken through.

• •

¶ From *Roads and Road Construction*, an English magazine we get the following: After the appointment of a Government Committee, Messrs. Aveling & Porter undertook the construction of a steam traction engine suitable for hauling heavy siege guns and artillery into position. This first "Steam Sapper" as the engine was aptly named, proved very satisfactory at the trials but was found to be rather heavy for the job. In 1871, a lighter machine, "Sapper No. 2," was specially constructed so that its total weight did not exceed that of the heaviest siege gun which, at that time, was the Armstrong breech loader of 95 cwts. Limitation of the engine's weight was to ensure that pontoon bridges were not overloaded.

In reporting the trials of the second "Steam Sapper," "The Engineer" of September 22nd, 1871, stated that it

was the lightest engine of the power yet constructed. At the trials the engine (6 h.p. nominal) drew a net weight of 15½ tons up the severe gradient of Star Hill, Rochester.

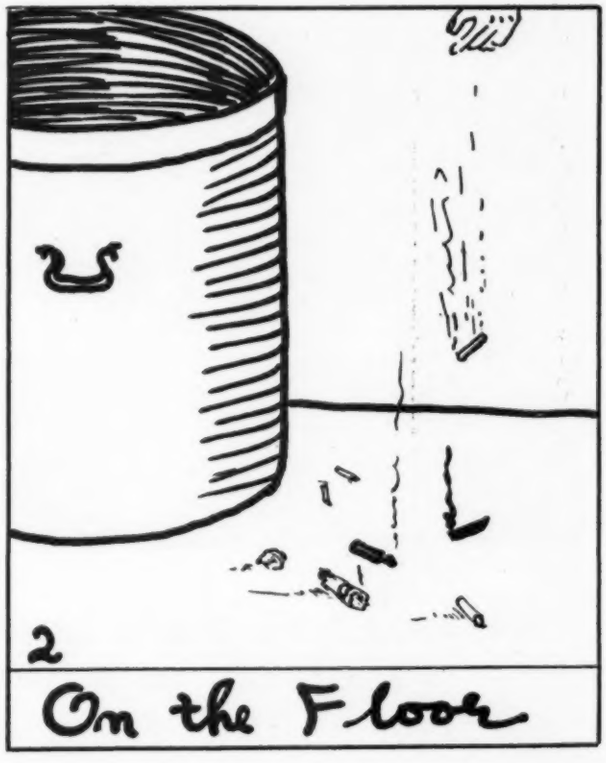
Thus began Army Mechanization, and records show that many "Sappers" were subsequently built for gun haulage.

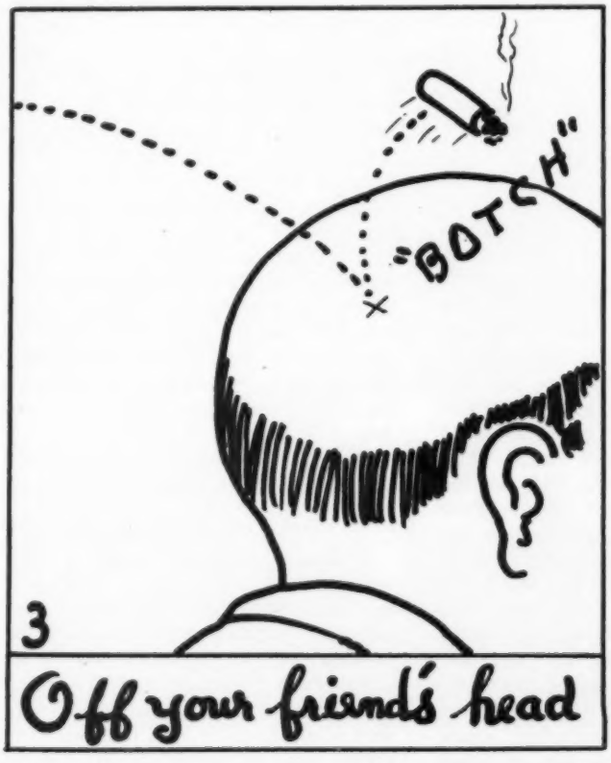
• •

¶ He: I'd like a copy of "Man, The Superior Sex."

She: Fiction department.

# Disposing of the Butt



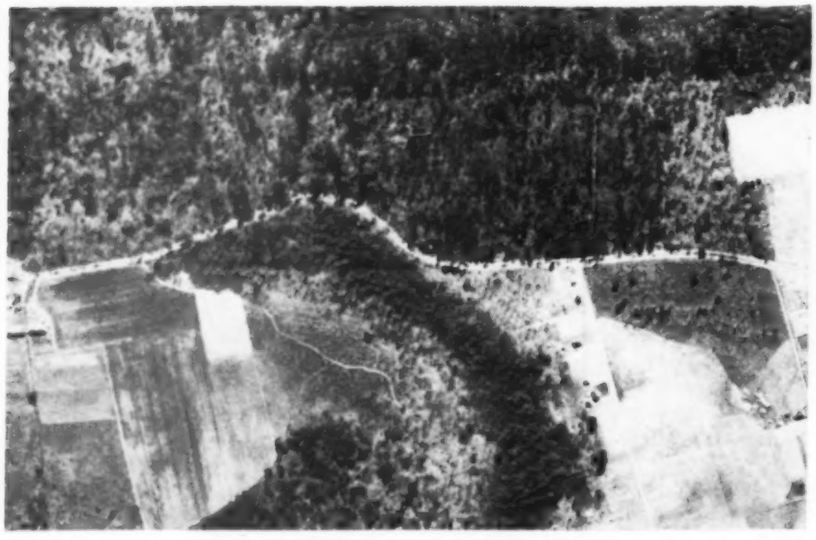
With the spring fire hazard period on the way ask your state highway engineer or any national park or forest superintendent which method he prefers.

ROADS AND STREETS, *February, 1942*

# TREES—By The Side of The Road

*By* **H. J. NEALE**

Landscape Engineer
Virginia Department of Highways
and
Chairman, Committee on Roadside Development, Highway Research Board



OVERHANGING TREES CAMOUFLAGE SECTIONS OF ROAD

NEVER before in the history of our country have highways played a more important role than they do today. Every road is a potential defense highway, an artery for the rapid movement of troops, while a combination of highways around densely populated cities, especially in defense areas, would have to serve as spreaders for evacuation of civilian population should we be invaded.

Highways without adequately developed roadsides to protect them impair their traffic-carrying capacities. Wide shoulders must be supplemented with emergency parking areas on all roadsides, and where wide sections of right of way are available, wayside areas can be developed which will furnish added facilities of safety and comfort. Waysides, when distributed along major highways at convenient and strategic places, can well serve as bivouacs or rest areas for troop movements, as well as civilian traffic. Wider roadsides will be required for the proposed "flight strips." All such areas, when exposed and not camouflaged with vegetation, would be easier targets for air attacks. Grasses, legumes, and vines form the important ground covers for hiding raw, colorful, exposed soils, while roadside trees not only help to screen such areas from the air but add tremendously to the attractiveness and utility of the roadsides.

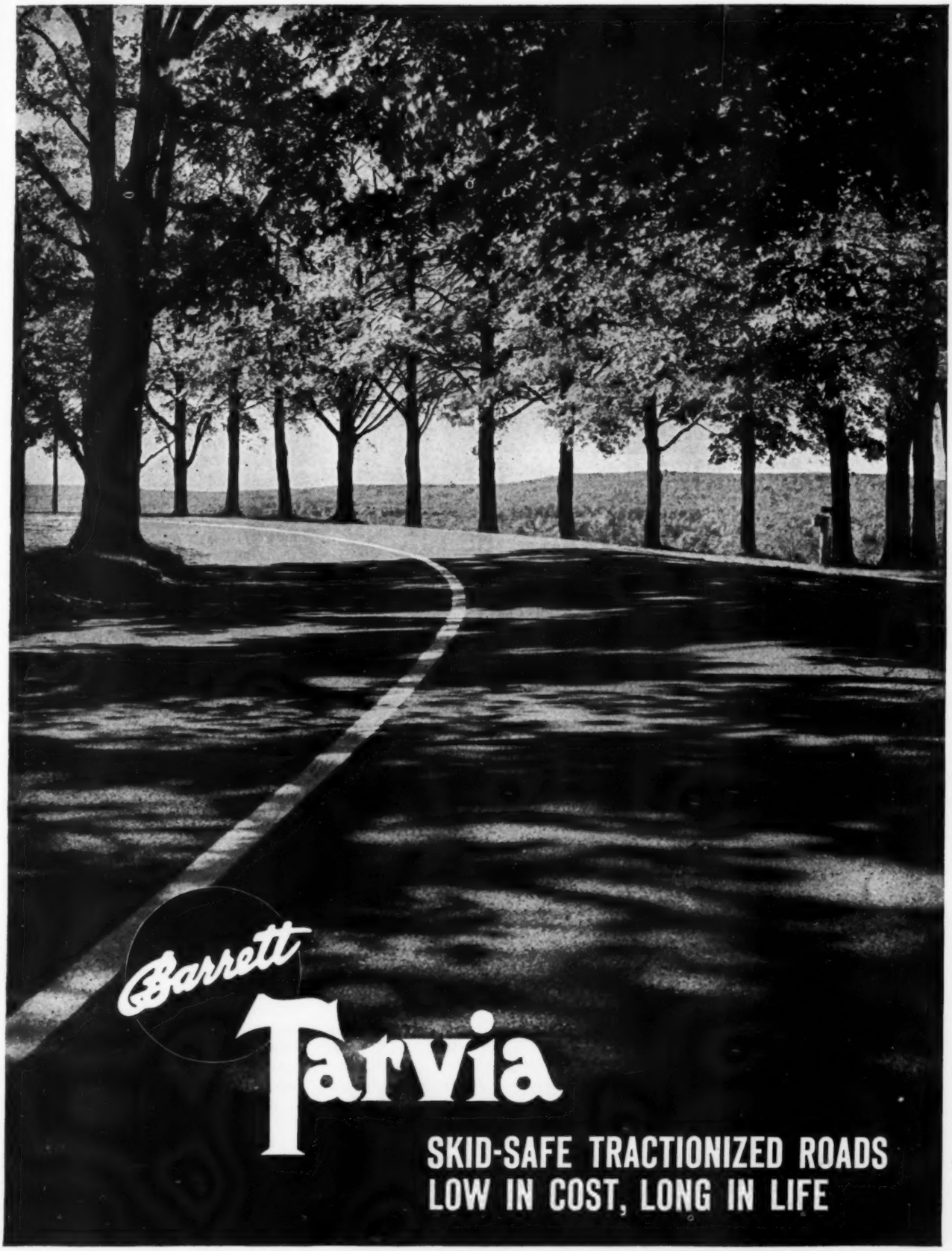
Who will deny that the highway camouflaged with over-hanging trees is not far safer during air raids than the open road? And yet we have seen in our day in so many cases an utter disregard for roadside trees. Trees have been sacrificed for highway widenings when minor road alignment changes would undoubtedly have saved a great many. Trees have been butchered for public utility line clearances, and others have been sacrificed for many lesser reasons. Fortunately, this is not common practice throughout the country. Some states jealously guard these roadside assets and give them primary rather than secondary consideration. It is not too late, America, to start to save your trees. Many defense highways are being rushed to completion at the present time, and on many of these there are trees that can be saved—trees that may help to save troops, civilians, even armies. Not only will the trees saved on these strategic highways serve for camouflage, but in a larger measure will add comforting shade from the heat of the sun or break the force of the wintry blasts, making the highway trip more pleasant and less fatiguing. When the days of war turn to days of peace, these same trees will serve the children and the children's children of those who cherished their protection during the perilous days. Some trees, no doubt, will even be added to the historic list of famous trees of our nation, where our heroes of today found inspiration and courage under their protecting arms.

"Those who live with trees come to know them as friends, trees with something added that makes them kin to those who understand and love them. Peace dwells in them; peace comes to us through them. In this world of frightened, wavering people, how serene, how noble, how comforting are the firm-hearted trees!" wrote Angelo Patri.

Trees have influenced humanity since the days of Adam and Eve.

### *Building for Future*

Highway engineers must be ever alert to take advantage of every opportunity. Not only are we building today for defense, but we trust, in a greater way for the peace that is to follow. The trying days will pass as they have so many times in the history of our country, and then another trying siege of rehabilitation, but as our forefathers conquered depressions by building for the future, so must we follow their example.

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# "AS SEEN FROM THE AIR"

## THE "DUAL HIGHWAY" FURNISHES A PERFECT TARGET FROM THE AIR EVEN SINGLE CARS CAN BE SEEN— WHAT IF IT WERE A CONVOY ?

We could build highways merely adequate for troop transportation and maximum traffic requirements and stop there, but in so doing, would we be contributing to the future security of our country? With constantly increasing use of our highways, our roadsides and countrysides have become the playgrounds for rich and poor alike. The complete highway is fast assuming the atmosphere of the parkway. Steep, barren, eroding slopes are no longer countenanced in most of our states. This is not merely an aesthetic gesture, but is done for far more practical purposes essential for slope control, drainage, and safety. Topsoil is being salvaged and used to advantage for vegetative covering of these slopes. Trees are being protected or transplanted, or young vigorous trees are being planted to replace those that have to be sacrificed.

These young trees are already screening pikes and shading U. S. Route 11—"The Valley Pike" in Virginia

There is no element of our roadside more universally appreciated than properly located and well-developed shade trees. The more majestic the tree, the greater it is admired. The stately pine, the majestic oak, the pendulous willow, the ghost-like sycamore, the colorful dogwood, redbud, and many others too numerous to mention, all have their devotees. Some admire their grandeur, others the grace and beauty of their changing colors, while all revel in their restful shade.

### *Effects of Constructions*

Construction changes involving road slopes and grades affect a great many roadside trees by changing the water table and reducing the ground water from which they obtain their nourishment. Immediate protective methods to counteract this loss of ground water or the loss of a part of the root system is absolutely necessary if trees are to be preserved. Too many highway trees have been lost in waiting for visible symptoms of deterioration before they were given even first-aid treatment. A careful analysis of the effects of construction on highway trees and resulting adjustment of grades or changes in alignment have, no doubt, saved many. Where this has been impracticable, tree wells or tree walls have been used to protect the exposed root systems, and in some cases watering and aeration systems have been installed. There have been instances where trees of doubtful value have been saved at apparently unjustifiable cost. To some, every tree is too valuable to be sacrificed. In the eyes of many, all trees are valuable, but in the final analysis, a critical evaluation should be made before arriving at any conclusions as to what extent a tree or group of trees justifies the cost of changing alignment, altering grades, or even having any public funds used to protect them. Such an evaluation involves several factors. There seems to be little doubt but that the first consideration given should be regarding the size and specie of the tree in question. For example, a sturdy, well-developed oak is worthy of more consideration than a fast-growing sycamore or willow. The oak may be considered primarily from its average long life under normal conditions, but the question here arises as to how long will the oak live normally under the adverse conditions which it will be subjected to by changing its environment. When its size is such as to allow for its safe transplanting, there is more justification in moving a larger oak than a willow or other rapid-growing tree of the same size. The species value must also be factored by the comparative conditions under which the tree has grown and its new location. A road cut through a forest or wooded area naturally brings many large and beautiful trees to the roadside, and here the question arises as to whether these trees, of various species, growing in the density of the forest under ideal ground conditions, will be able to withstand the exposure, the drafts, and the changed water table along the new roadside. Many of these trees in the wooded area have grown so close together that they have lost their normal shape, and could hardly be considered specimen trees, but by judicious selective thinning and grouping, ideal landscape settings can be developed.

### *Evaluation Insitu*

Some trees must be evaluated by their historical significance, as those that commemorate the spot where some great national or even local event occurred. Probably the most important of these was the Magna Charta Oak, while there are others closely allied with the lives of George Washington and other heroes, to say nothing of trees that played important parts in wars as well as in times

of peace. Here the species value is not of so much importance as the probable life of the tree, especially in its changed environment. However, science and modern practices have made it possible to give these trees added protection through invigorating and stimulating measures, which would be amply justified, instead of sacrificing them.

In determining values it does not always follow that the same species would have the same value in every location. One tree of a specie might be more susceptible to insects or diseases in one section of the country, or even of the same state, than a similar tree in other sections. The cost of maintaining and protecting a tree located in an area where it would be susceptible to the ravaging influence of disease would be far greater than the same tree in another location where this specie is practically immune. To what extent the saving of the tree in the first case would be justified, would therefore, depend largely on the estimated cost of maintaining it or whether there are trees of other species having greater immunity to diseases and insects in or near the same area which would provide equal landscape values, and the loss of the particular specie would not be severely felt. For any such analysis, it is most important that a person thoroughly familiar with tree conditions of the locality make the evaluation and recommendations.

To outline a formula involving the many factors of location, size, species value, historic value, physical condition, susceptibility to the ravages of insects and diseases, etc., which would apply to all states or even all areas in one state might be developed. It is doubtful as to what particular value it would hold. The general premise should be to save all trees along the roadsides that do not interfere with traffic or impair sight distance, and which have definite landscape values. In saving these trees, if the question arises as to the justification for using protective methods to prolong their life under the changed conditions, the species value, location, and cost of protective work should be compared with the probable life of the tree under changed conditions, together with the cost of the after-care.

The subject of location is one that might be amplified. A tree or group of trees located within a suburban residential area is naturally of greater value than similar trees in the rural or wide open areas. There is more justification for expending public funds to protect trees in the former case than in the latter, although they may be of the same species. However,

## OVERHANGING TREES CAMOUFLAGE THE ROAD ON THE LEFT

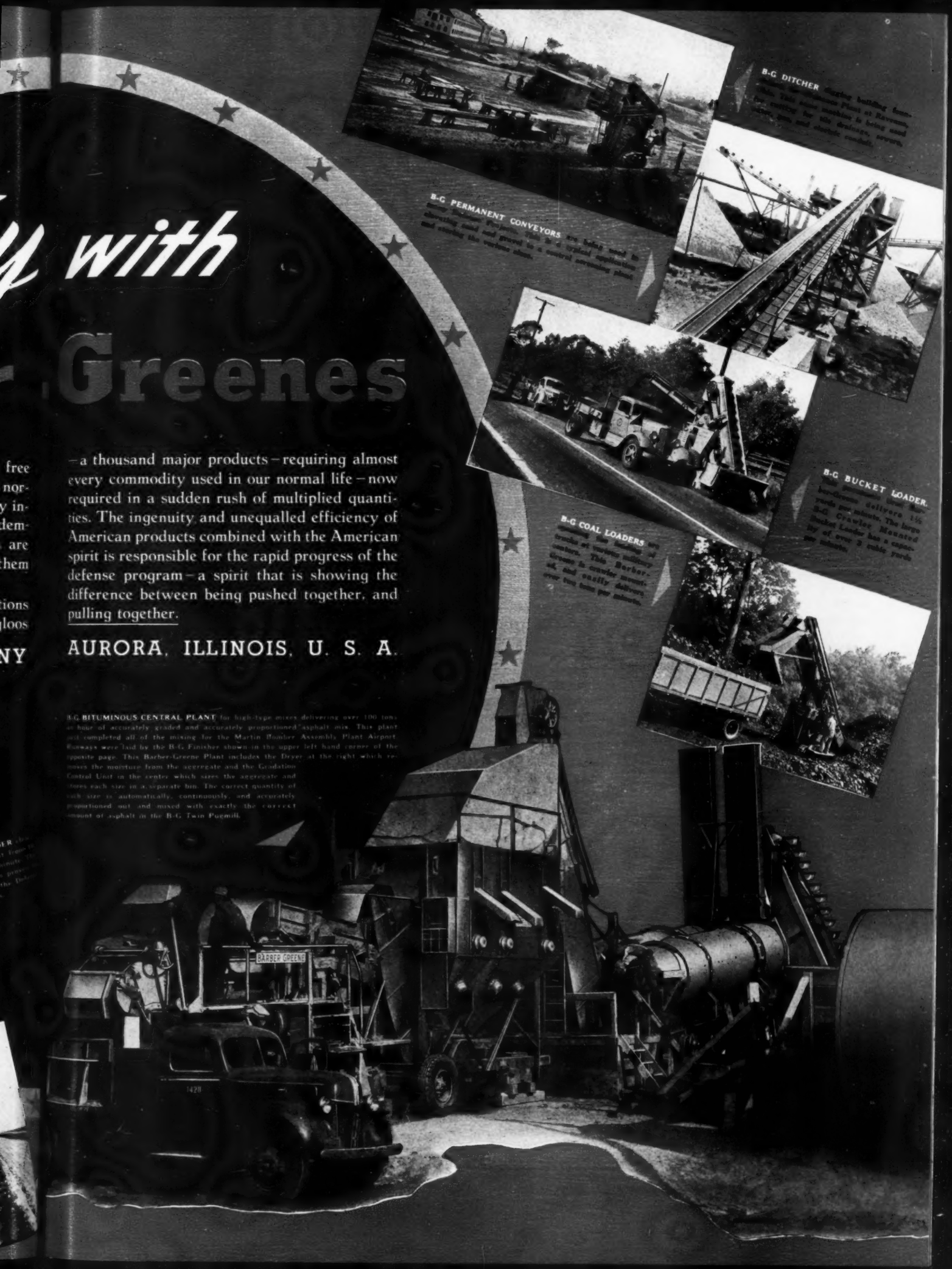
trees in the rural area, especially along highways built on new location, must be considered from the standpoint of the probability of future residential developments in the area.

There is another important basis for consideration with respect to replacement cost. In some cases, the loss of trees due to construction, and particularly those which would require expensive protective treatment, would not be so keenly felt in the rural areas as in the residential. In the latter, there is little doubt but that any reasonable outlay would be justified. In the former, however, the same money expended on the planting of young vigorous trees would in time prove far more valuable to the entire community. This should allow for the planting of young trees over considerable mileage, trees which would increase in value each year and ultimately produce more shade and endow the highway with far greater landscape values than a single tree or group of trees. These could in a great many cases be planted for what it would cost to protect and maintain the older single tree or group of trees under consideration.

The particular advantage in planting young trees along the highways is that they can be properly spaced or grouped in presumably permanent locations. Formally planted trees could

This tree covered Virginia wayside between the north and south bound lanes of a defense highway can be used as a bivouac or a resting place. This main highway was divided at this wayside to preserve the ancient stone arch bridge and mature trees

292
291
Speeding Victory
Barber
THESE machines are the products of free enterprise, developed in times of peace for normal functions. They are typical of the many ingenious results of the open competition of a democratic system. Now these very machines are working to defend the system that made them possible.
There is much more to defense than munitions . . . the building of camps, airports, roads, igloos
BARBER-GREENE COMPANY
B-G FINISHER laying runways for Martin Bomber Assembly Plant Airport, Fort Crook, Nebraska. The B-G Finisher receives the asphalt mix from trucks, evenly spreads it, compacts it to a uniform density, and automatically lays a level surface even over an irregular sub-base.
UNION COUNTY SAVINGS BANK
B-G PORTABLE CONVEYOR
B-G "GOOSENECK" COAL LOADER,
B-G SNOW LOADER
B-G TRAVEL PLANT
B-G CAR UNLOADER




# ...with Greenes

—a thousand major products—requiring almost every commodity used in our normal life—now required in a sudden rush of multiplied quantities. The ingenuity and unequalled efficiency of American products combined with the American spirit is responsible for the rapid progress of the defense program—a spirit that is showing the difference between being pushed together, and pulling together.

AURORA, ILLINOIS, U. S. A.

B-G BITUMINOUS CENTRAL PLANT for high-type mixes delivering over 100 tons an hour of accurately graded and accurately proportioned asphalt mix. This plant just completed all of the mixing for the Martin Bomber Assembly Plant Airport Runways were laid by the B-G Finisher shown in the upper left hand corner of the opposite page. This Barber-Greene Plant includes the Dryer at the right which removes the moisture from the aggregate and the Gradation Control Unit in the center which sizes the aggregate and stores each size in a separate bin. The correct quantity of each size is automatically, continuously, and accurately proportioned out and mixed with exactly the correct amount of asphalt in the B-G Twin Pugmill.

The symmetry of these trees is lost forever as a sacrifice to overhead wires

be used to distinct advantage in the open countryside to outline vertical and horizontal road curvature, and give the motorists a better indication of safe-driving speed than any highway warning sign. Trees of uniform size and specie in formal rows outlining intersections, in front of residential areas, public buildings or other places where people constantly congregate, should be of tremendous value to the motorists of the future, who would soon learn that on seeing such formality several hundred feet away, that they were approaching a congested or potentially hazardous area. It is not my purpose to definitely recommend either the informal or formal planting, but some such common practice adopted today would, no doubt, mark a milestone in highway planting procedure as our contribution to future safety on our highways.

### *References*

The report of the Committee on Roadside Development to the Highway Research Board of December, 1940, carries a report of its Subcommittee on Plant Ecology entitled "The Selection and Use of Trees on Highway Areas" by George B. Gordon, chairman of the subcommittee, which is recommended to anyone interested in a thorough and complete analysis of the subject, particularly with respect to the Northeast and Middle Atlantic States. This report stresses the need for adequate right of way for the establishment and maintenance of permanent roadside trees. It emphasizes the need for improved highway design involving the flattened and well rounded cross section, as compared with the steep cut and fill slopes for the permanent establishment of roadside trees. A permanent border zone is urged by the committee to insure high-growing, broad-topped trees being undisturbed by future traffic lane construction or by the construction or maintenance of pole lines or under-ground utilities.

The report carries three very valuable tables, adaptable to the Northeast and Middle Atlantic States. Table 1, "A Partial List of Common Native and Naturalized Deciduous Shade Trees for Roadside Planting," lists the Red and Sugar maple, Honey locust, chestnut and Red oak as trees susceptible to transplanting, available in many nurseries, free from insects and disease, fairly long lived, of moderately rapid growth, and having good fall color. Table 2, "A Partial List of Common Native Small Trees for Roadside Planting," lists the Flowering dogwood, hawthorne, American plum and Staghorn sumac, in order, and the shadblow, redbud, persimmon, wild crab apples, Chickasaw and Beach plum, as having good flowering effect, fine fall color, or both, and are readily grown on properly selected sites. Table 3, "A Partial List of Evergreen Trees of Value for Roadside Planting," recommends the Virginia scrub pine and the Canada hemlock as first, the Red cedar and Southern magnolia as second, and the American holly, spruce and arborvitae as third, for values in roadside planting. The committee, however, adds this note, "Evergreen trees cannot be used in humid 'hardwood' regions to replace deciduous shade trees which are the 'backbone of good roadside planting.' Only where evergreens exist along a roadside should these trees ordinarily be used in numbers on a planting project. Evergreens are most valuable for screen planting and as a background for flowering trees, white birches, etc."

This report also carries other tables, including (4) "Some Common Plant Indicators: Shrubs Found Along Roadsides," (5) "Landscape Analysis of Certain Planting Sites on Roadsides — Cut-over or Cleared Roadsides" and (6) "Landscape Analysis of Certain Typical Planting Sites on Roadsides—Woodland Roadsides."

This report is recommended to all agencies, particularly in the Northeast and Middle Atlantic States, but can be used for comparative purposes for any section of the country. It is not intended to cover all trees and shrubs in the area, but merely those found by common practice to be the most useful for highway planting.

Transplanting instead of cutting down

An inexpensive rock wall protected the roots of this group of trees

This retaining wall eliminated the necessity for sloping and cutting roots of the bordering trees

A simple tree wall of creosoted piling protects the roots of this live oak

A wayside table under inviting shade

***Conclusions***

It should not be for the tree loving fanatic on the one side, or the highway engineer on the other, to be the final judge and determine the fate of a tree or group of trees. The landscape engineer should be able to evaluate the desires and requirements of both. His experience should qualify him to compute the probable life of trees, even under adverse conditions, and he should be in a position to make proper estimates of the cost of protection and subsequent maintenance and either prepare sufficient justification for engineering changes, for adequate treatment, or for reasonable replacement that might serve in a more appropriate manner for future uses and under the same relative cost. Wherever doubt exists as to the possible length of life of the tree in question, low cost first-aid preventive and protective methods might well be used, supplemented with the planting of other trees nearby, which will serve to replace the questionable tree when it eventually dies. This might well be done in a great many cases and serve a dual capacity at approximately the same cost.

If we of today, in our rush to construct highways adequate for defense purposes alone, do not supplement this with roadside facilities, including appropriate tree protection and planting, which will serve the present day needs and provide heritages for the future, we will not have fulfilled our full service to our country.

# Salt Shatters Snow and Ice Crusts

BARE pavement maintenance of city streets and main highways during the winter months sounds like a big undertaking for the maintenance engineer. At the present time this type of maintenance is practiced by many street and highway engineers. The cost is little if any more than the cost of the other method, that of spreading treated abrasives over ice or snow covered streets. The increased volume of traffic, resulting in more business and greater revenue from gasoline taxes, more than makes up any differences in costs of the two types of maintenance. Added to this is the greater satisfaction on the part of the motorists.

There are two general winter conditions which cause hazardous driving.

One is snow, which under traffic, packs and bonds to the pavement surface. When the snow is later plowed, there invariably remains the layer of packed and glazed ice which cannot be easily removed with blade equipment. Many highway engineers spread small amounts of rock salt, ¼ to ½ lb. per sq. yd., over the roadway as soon as the snow has fallen to a depth of ¾ in. to 1½ in. This rock salt will pit its way through the packed snow to the pavement surface where the brine formed will break the bond and keep the snow in a loose mealy condition so that all of it can be plowed to the curb, leaving a clean bare dry surface as shown in the picture of East Avenue, Rochester, N. Y.

The other condition is sleet, which generally is rain that freezes on contact with the cold pavement. As in the case of snow, the same small amount of rock salt spread over the icy pavement early in the storm will melt whatever ice has formed, and the brine remaining on the pavement surface will prohibit the formation of ice so that after the storm the pavement, free from ice, will soon dry off.

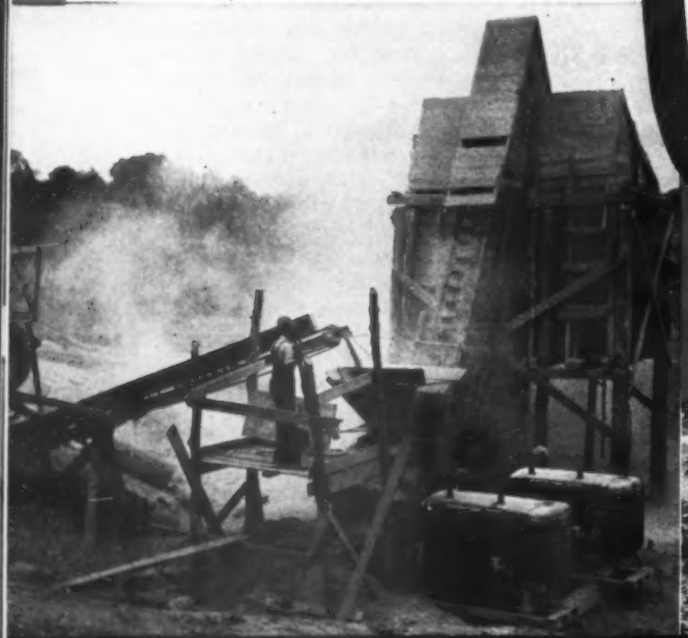
Today, when our Country is hurriedly arming itself, materials and supplies must move safely over our highways throughout the winter months. The importance of motor freight is greater than ever. Delays due to hazardous pavements are time consuming and retard our defense work. Accidents tie up for repairs or often completely destroy our motor carriers so necessary for moving materials and supplies. At this time we cannot afford to have our highway transportation systems crippled by hazardous pavements. This places the extreme burden of responsibility on highway maintenance forces to keep our roads and streets in the best possible driving condition this winter.

The National Safety Council Committee on Winter Driving Hazards, 1940 report, on page 22, states, "*A. Bare Pavement Maintenance.* The maximum safety is provided, of course, when snow and ice are completely removed, leaving a bare pavement surface. Bare pavement maintenance is a policy now rapidly being adopted by many street and highway departments for major and secondary streets and highways, to assure maximum safety and mobility for traffic during the winter months. There are several general methods for attaining this objective."

Arthur C. Toaspern, Sullivan County Superintendent of Highways, Barryville, N. Y., in an article published in 1940 states, "In provisions for snow removal from roads, a high-speed displacement plow or the rotary plow leaves little to be desired. But, today the motorist is not content with snow removal alone, he wants a road surface free from ice, and ice removal is beyond the ability of machines alone. Ice occurs from rain freezing on the cold, bare pavement or from the compaction of snow by heavy traffic under varying temperatures. In both cases the thin layer and the close bond of the ice to the pavement make removal by scraping or picking virtually impossible. Moreover, re-formation of the ice is in nowise prevented. The Sullivan Coun-

*Carving a new road through mining property in Utah, with an International TD-18 Diesel TracTracTor, equipped with bullgrader.*

*Two International UD-18 Diesel Power Units operating lime crushing outfit near Kirksville, Mo. An economical pair of engines—with stamina and dependability for a variety of jobs.*



# IN THESE TIMES LET'S FACE THE FACTS

THESE are *different* times than any of us have experienced. The *one* great common *goal* governs all our thinking and all our action. *All* of us must now face facts with *common sense* for a mutual solution of the problems of today.

One fact to be faced is this: there may not be enough new machines to go around. International Harvester will do its best to provide its customers with as much new machinery as possible. But plans laid today must be flexible enough to meet tomorrow's situation.

In such a time users can appreciate what International QUALITY and International SERVICE mean. International TracTracTors, Wheel Tractors, and Power Units are having to work harder and live longer. They're doing just that, because they are *designed* and *built* for the *long pull ahead*. A broad background of manufac-

*Below: Putting a new angle on a road grade with an International-powered grader. The engine is an International UD-14 Diesel.*

INTERNATIONAL

# WITH COMMON SENSE

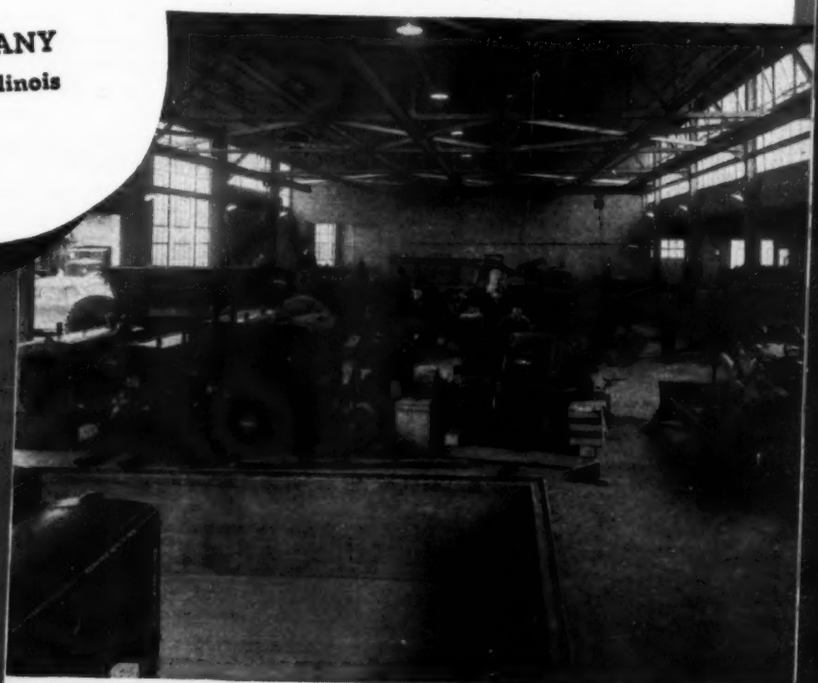
*Used tractors in an International Industrial Power dealer's showroom, all thoroughly reconditioned and ready to go to work.*

turing, engineering, and metallurgical experience stands behind every tractor and engine carrying the International nameplate. International equipment is *proved all ways for come what may!*

But even the best machines need a regular program of servicing, preventive maintenance, and overhaul. Arrange with the International Industrial Power dealer for tractor and engine service and check-ups regularly. He is equipped to do a service job as never before, to help you prolong the useful life of your equipment. His service facilities, trained servicemen, and stocks of genuine IHC Parts are at your command . . . backed by 85 Company branches coast to coast.

**INTERNATIONAL HARVESTER COMPANY**
**180 North Michigan Avenue** **Chicago, Illinois**

*Section of a dealer's parts department devoted to such large, heavy parts as tractor tracks, sprockets, etc.*



*A dealer's main service shop and assembly floor. Note convenient unloading dock in foreground.*

**INTERNATIONAL HARVESTER**
**Builds for Victory**

Crawler-Type Tractors
Motor Trucks
37 and 75 mm. Shells
Intermediate Caliber Artillery
High-Speeding 155 mm. Gun Carriages
Packing Stops for Shell Containers
Oerlikon Anti-Aircraft Gun Mounts
Anti-Tank Gun Carriages
Refrigeration Equipment for Army Camps

L Industrial Power

ty highway department is solving the problem with rock salt.

"The salt trucks start out at the beginning of a storm; they are light dump trucks, equipped with a spinner type sand or chip spreader. Bulk rock salt is loaded on the trucks and fed to the spinner through a hole in the tail gate in the proper amount to give a spread of about ¼ lb. of salt per square yard of pavement. The speed of the truck is controlled to give the proper spread."

Miles E. Evans, Director of Public Service, City of Cleveland, Ohio, in an article appearing in November, 1940, states—"We have the usual modern snow and ice control and removal machinery with which all street maintenance officials are familiar. However, we believe we do our job more thoroughly and with a smaller proportionate investment in expensive machinery and in manpower, because of our speed methods and the use of rock salt.

"We have found that if we can get our salt trucks out and busy right at the start of a storm, we can save many weary hours of plowing, scraping, shoveling and trucking snow later on. The reason is that if the storm turns out to be a light one, our early spread of rock salt will, in many cases, melt it away completely. If the storm is severe, with a heavy fall of snow, the work of the plow crews is made just that much easier because the rock salt keeps the snow from packing down and bonding to the pavement surface, so that one pass of the plow can remove it."

John S. Flockhart, Principal Asst. Engineer, Bureau of Street Cleaning, Newark, N. J., in an article September, 1940, states, "Acting under the instructions of James W. Costello, Chief Engineer of the Department of Public Affairs, Newark, New Jersey, Goline Doremus, Deputy Chief Engineer in charge of the Bureau of Street Cleaning, during the winter of 1938-1939 conducted experiments with rock salt in preventing the formation of ice and snow on some of the principal streets of the city. This proved to be so successful that as a part of the snow removal organization for 1939-1940, a salt spreading detail was formed.

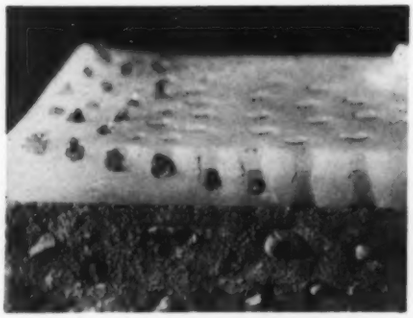
"This unit consists of the personnel who are normally assigned to the double shifts worked by the motor pick-up sweepers and hence are available at any hour of the day or night. At the first indication of sleet or snow, these crews report at the Hayes Street City Yard, where the salt is stored and from where the operations are directed. The two large sand spreaders owned by the Bureau are

East Avenue, Rochester, N. Y., scraped clear of snow after salt had decomposed packed snow and ice

kept at the city garage filled with salt and ready for immediate action. Four 5-ton dump trucks are equipped with smaller portable spreaders and sent to the yard where they are loaded with salt. If the storm is expected to be particularly severe, empty trucks are also sent to be loaded and a crew of men assigned to spread the salt by hand at dangerous intersections."

Loren G. Kurtz, Director of Motor Equipment and Maintenance, Department of Sanitation of the City of New York, in an article which appeared in ROADS AND STREETS, August, 1941, states, "Executives of the department feel that the application of salt, in the case of icy pavements, or sand, as in the case of slippery snow, make the streets more passable, and that the ultimate cost of removing this snow and ice from the pavement is reduced to many times less than should we attempt to plow to the curb and then eventually remove the snow by means of a snow loader. Even in the event of a considerable fall of snow, the application of salt at the beginning of the storm so decreases the ultimate volume that only 25 per cent to 50 per cent of the original amount has to be removed."

E. A. Miller, Supervisor of Maintenance, Department of Public Works, Rochester, N. Y., in an article appearing in ROADS AND STREETS, February, 1939, states, "There is no doubt that the accessibility of the highway is a direct factor in store sales and the city's business in general. In



Action of rock salt pitting through ice

Rochester we are in the snow belt where we must be prepared to meet a snow or sleet condition from November on through March and April, and keep our streets clear so that business is not hampered by snow-covered or icy streets.

"As in any business, proper equipment and materials are the only effective and economical means of combating our ever-present winter problem of ice and snow.

"Time is our most important element, in that proper application of effort at an early stage of a storm places us in complete control of the situation. We cannot be caught unprepared because when a storm starts, it must be attacked immediately or else its damage to life and business is increased. Furthermore, if snow and ice are allowed to accumulate, equipment will not operate with as great efficiency and the total cost of clearing the city streets is much higher.

"Here in Rochester, we find that straight rock salt is the greatest single aid in our winter maintenance problems. It has been shown here that rock salt will, when properly applied, eliminate the building up of snow on the pavement into a thick mat of ice. Furthermore, the salt placed on the surface of ice will pit itself through the ice to the pavement surface, and the brine formed in the pit holes will run its way along the top of the pavement. This honeycombed action on the ice will cause it to be broken up under traffic."

These and many other highway engineers are finding that the burden of keeping their main thoroughfares open and clear of ice and snow, even from the beginning of the storm, is greatly lessened by the practices described above.

## 10.7% Increase in Gas Consumption in 1941

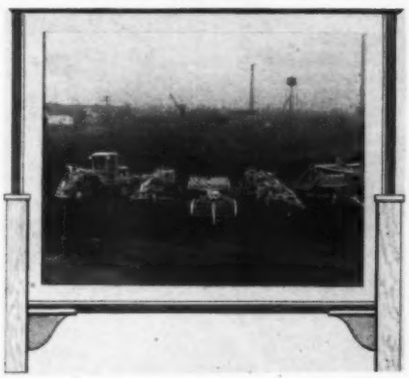
Gasoline consumption in the United States was 2½ billion gallons greater in 1941 than in 1940, according to an estimate made by the Public Roads Administration, Federal Works Agency. The estimate is based on reports from tax collection agencies covering at least eight months of the year. Highway use amounted to 24.3 billion gallons out of a total use of 26.6 billion gallons. For the entire United States, the increase amounted to 10.7 per cent. Alabama and South Carolina had the greatest increases, 19.4 per cent. Other states with more than 15 per cent were Florida, Kentucky, Louisiana, Mississippi, North Carolina, Tennessee, and Virginia. The District of Columbia had a 15 per cent increase.

# Roads and Streets ROAD SHOW

EARLY in 1941 when industrial activity was becoming more intensified it seemed questionable as to whether or not it would be possible to hold a Road Show in 1942. At that time members of the Manufacturers Division of the American Road Builders' Association appointed a committee to make a study and recommend a plan for the support of the American Road Builders' Association in case a Road Show was not held. As a result the Sustaining Membership Plan was adopted whereby members of the Manufacturers Division would subscribe to sustaining membership in the A.R.B.A. and by this means assure the continuance of the activities of the Association which are even more necessary at this time than heretofore. According to this plan the quota agreed to for 1942 has been oversubscribed. However, the amount to be utilized by the A.R.B.A. in this year remains the same.

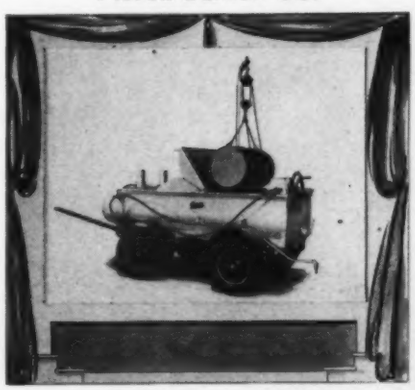
ROADS AND STREETS Road Show is made up of the sustaining members of the American Road Builders' Association. At a regular show other manufacturers would probably exhibit but we have no way of knowing who they might be. Consequently our show includes only those manufacturers who are sustaining members of A.R.B.A. Had more manufacturers become sustaining members, then we would have been able to give them an exhibit in this show. While some new machines woud have been exhibited, for the most part, they would have been current models. Our show is an exhibit by manufacturers of what they would have shown had there been a Road Show. Following is ROADS AND STREETS Road Show:

## J. D. Adams Co.



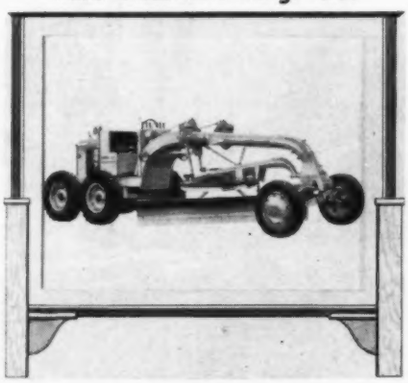
Left to right are: Adams 412 motor grader, 201 motor grader, Tamping roller, (foreground maintainer, leaning wheel grader, and hauling scraper. The new bulldozer would also have been shown.

## Aeroil Burner Co.



Aeroil Heat-Master kettle for road building and repair work. Other equipment featured would have been cut-back and emulsion sprayers, tool and asphalt surface heaters, signs, signals, and stanchions.

## Allis-Chalmers Mfg. Co.

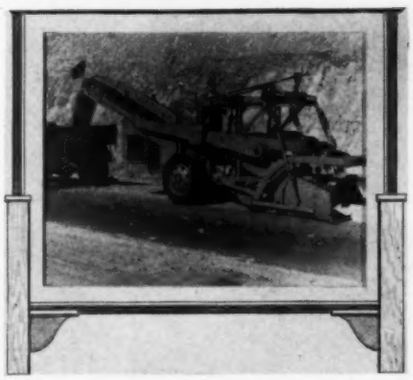


Allis-Chalmers 75 H.P. diesel motor grader. Other equipment shown would be a complete line of 2-cycle diesel track-type tractors, 4 sizes of gasoline tractors, 5 power unit models, 2 wheel tractors, and auxiliary equipment.

## American Manganese Steel Division of the American Brake Shoe and Foundry Company

Amsco renewable lip dipper of 13% manganese steel. Also on exhibit would be Amsco ⅜, ½, and ⅝ yard one-piece dippers, Amsco dipper teeth, dragline bucket lips, chain and parts; and Amsco welding products for reclamation, hard surfacing and repairing of roadbuilding equipment.

## Athey Truss Wheel Co.



Tow-type Athey force-feed loader. Other machines exhibited would be the Mobiloaders for "Caterpillar" diesel tractors, Athey rock and dirt trailers, and track-type wagon and trailer equipment.

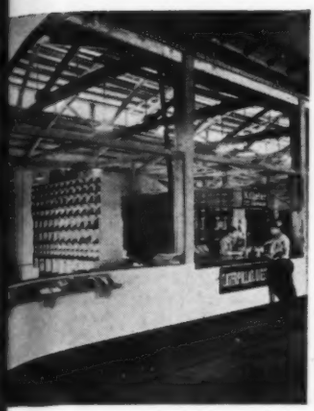
## Armco Drainage Products Assn.

The Armco Drainage Products Association has been concentrating on adapting its normal drainage and related products to wartime uses. Some of the adaptations that might have been exhibited are: The use of Armco multi plate for munition storage "igloos"; the multi plate pipe and standard corrugated culvert pipe for air raid shelters; and the use of bin-type metal retaining walls to serve as barricades at the various munition or ordnance plants, for isolating any blasts that might occur. These metal walls, built in U shape, are also being considered as protection for grounded bomber planes against splinters and flying fragments.

***EACH DOT A "CATERPILLAR" BASE***

**"Caterpillar" parts-and-service facilities are the most complete and readily available of their kind. No contractor in the United States is more than a few hours (often it's only a few minutes) from stocks of genuine parts and factory-trained servicemen.**

# KEEP 'EM FIGHTING!



SHIPS, tanks, planes . . . only with the support of well-equipped naval, military and air bases can these vital arms of war make full use of their might wherever the challenge must be met.

The efficiency of construction equipment—whether defense, public or private—is governed by the same need . . . BASES. Brawn, stamina and big work-capacity are built into "Caterpillar" Diesel Tractors. But to enable them to "take it on the chin and keep on coming," well-stocked replacement-parts and quick mechanical-service facilities are essential.

"Caterpillar" dealers provide just such "advance bases." All have heavy investments in parts, repair equipment and servicemen pay-rolls. They help to keep idle time down and work hours up for the contractor . . . to keep the far-flung fleets of "Caterpillar" Diesels "fighting"!

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

## CATERPILLAR DIESEL

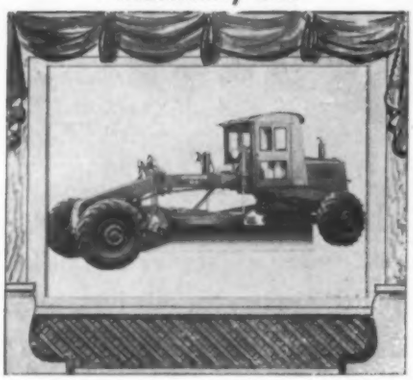
REG. U.S. PAT. OFF.

TRACK-TYPE AND WHEEL TRACTORS • ROAD MACHINERY • ENGINES AND ELECTRIC SETS

★ FOR VICTORY ★

*Our armed forces have first call on "Caterpillar" production. We thank customers who have suffered delivery delays by giving clear right-of-way to our Victory efforts.*

## The Austin-Western Road Machinery Co.

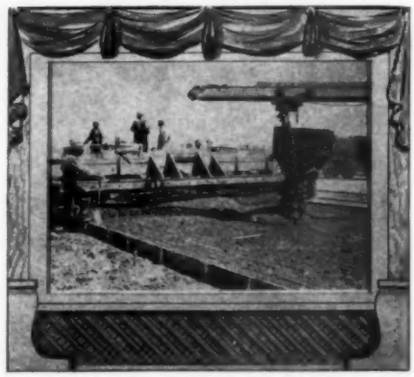


Austin-Western power grader. Also exhibited would have been the motor grader, patrol sweeper, blade grader, tandem roller, 3 wheeled roller, crawler shovel, and crushing and screening plants.

## The Barrett Division

If they could the Barrett Division would serve cider from the Barrett Tarvia Truck. Their representatives would be on hand to discuss the latest methods of using "Tarvia" and "Tarvialithic" in the construction, repair, and maintenance of highways.

## Blaw-Knox Co.



Blaw-Knox transverse blade concrete spreader. Other equipment featured would include road forms, tamping rollers, crub and gutter forms, truck turntables, trukmixers, concrete buckets, bulk cement plants, road finishing machines, central mixing plants, trukmixer loading plants, clamshell buckets.

## The Baker Manufacturing Co.

Baker hydraulic bulldozer. In addition would be shown the Baker hydraulic gradebuilder —model each of Baker "V" and blade type truck snow plow—tractor "V" snow plow—4 yard hydraulic scraper—and disc grader attachment.

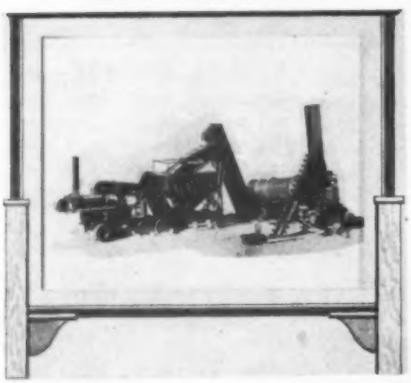
## Bay City Shovels, Inc.

Heavy duty Bay City ¾-yard machine with "Caterpillar" diesel engine and skimmer attachment. Other items exhibited would be the heavy-duty 1¼-yard shovel, 20 ton crane, and the cranemobile, mounted on a specially designed crane carrier.

## Brooks Equipment and Mfg. Co.

Brooks Load Lugger.

## Barber-Greene Co.

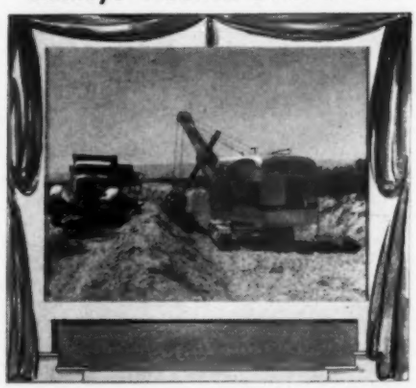


Barber-Greene bituminous central plant. Also displayed would have been Barber-Greene tamping leveling finisher, bucket loaders—crawler mounted and pneumatic tires, vertical boom ditcher and snow loaders.

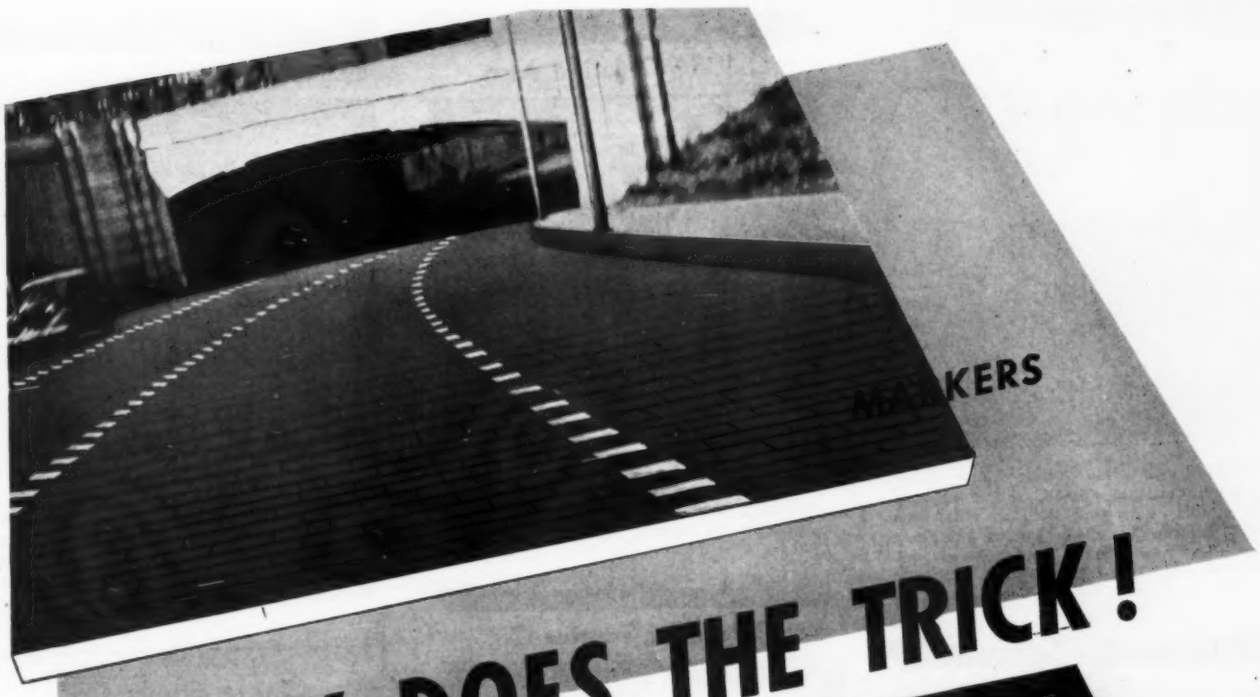
## Blackhawk Manufacturing Co.

Blackhawk power packer pump used in conjunction with snow plows and road machinery. A complete line of hydraulic jacks, wrenches, and Porto-Power would have been shown.

## Buckeye Traction Ditcher Co.



Buckeye metered vacuum control convertible shovel. Also on display would be a Buckeye model 410 automatic type control ladder-type trencher, Buckeye cable controlled unitilt bulldozers and trailbuilders. Buckeye power control units, Buckeye R-B finegraders, road wideners, spreaders, backfillers and trailers.




# BRICK DOES THE TRICK!

*Usually* this page tells you of modern smooth-riding brick roads and streets that give lowest cost per year of service. But there are special uses of brick that engineers find most helpful—applicable perhaps to some job you're now planning. You'll find that brick gutters and parking strips used with other pavement types give a better job . . . stops erosion at the curbs . . . prevents damage at bus stops . . . facilitates traffic . . . and gives a trim finished appearance to the traffic-way. The cost is small but the advantages are substantial.

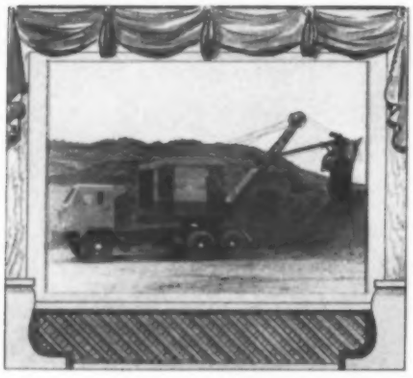
Traffic markers of brick are commonly used for center lines and lanes, but are equally serviceable for pedestrian crossings and safety areas. They are permanent and eliminate maintenance and reduce accident hazards.

Write for descriptive literature on these special uses. Address National Paving Brick Association, National Press Building, Washington, D. C.

*Buy United States Savings Bonds and Stamps* FOR DEFENSE

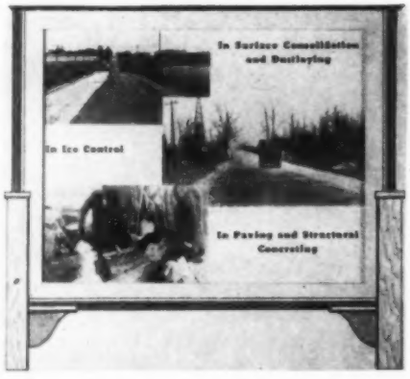
**VITRIFIED BRICK**
**THE MOST SATISFACTORY PAVEMENT**

## Bucyrus-Erie Co.



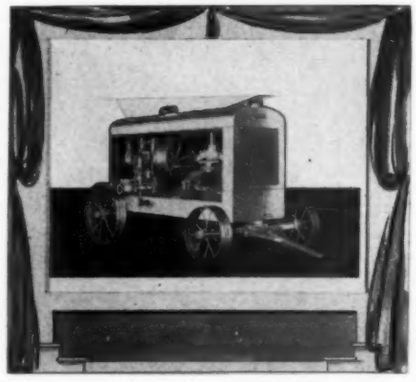
New Bucyrus-Erie convertible transit shovel, dragline, clamshell, crane, and dragshovel. The exhibit would have included other items from the shovel line and tractor equipment for International TracTracTors.

## Calcium Chloride Assn.



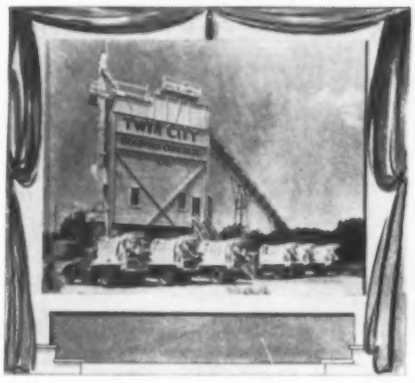

Combination photograph showing use of calcium chloride in road surface consolidation, in ice control, and in concreting.

## C. H. & E. Manufacturing Co.



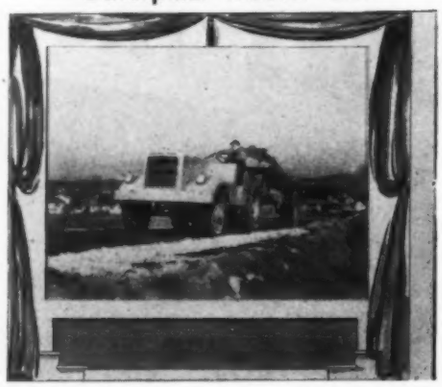
C. H. & E. road pump. Other equipment that might be exhibited would be portable saw rigs and band saws; single and double diaphragm pumps, self-priming centrifugal pumps, piston and triplex force pumps, hoists, tandem rollers, bar cutters and bar benders.

## Butler Bin Co.



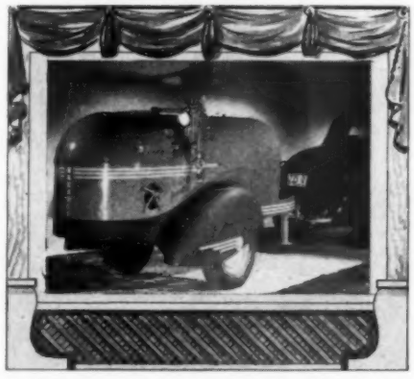

Butler 316 cubic yard seven compartment plant. Also featured would be the complete line of ready mixed plants, central mixing plants, batching bins, and weighing batchers.

## Caterpillar Tractor Co.



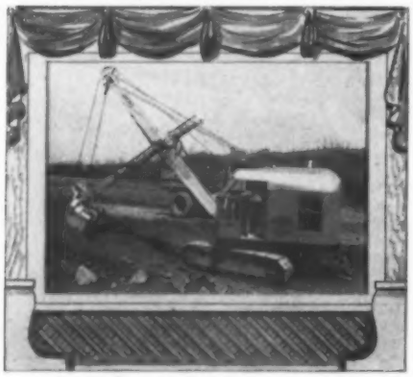
"Caterpillar" diesel DW10 tractor and W10 wagon. Included in the exhibit would have been "Caterpillar" diesel tractors, motor graders, elevating grader, diesel engines, diesel marine engines, diesel automotive engines, and diesel-electric sets and power units.

## Cleaver-Brooks Co.



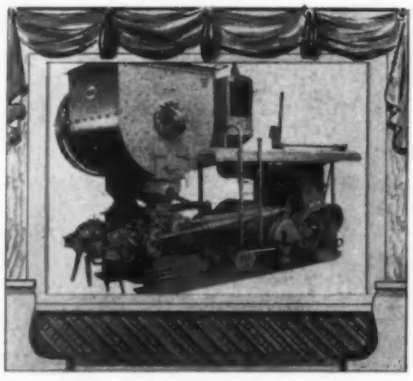
Cleaver portable tank car heater. Also shown would be Cleaver heating equipment for bituminous materials in tank cars and storage tanks.

## The Byers Machine Co.



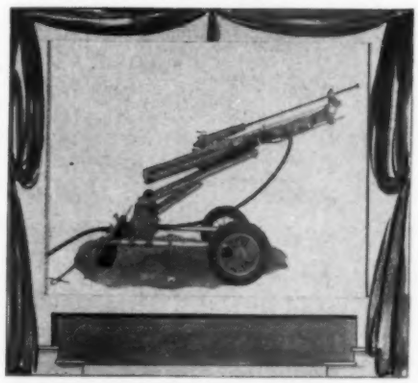
Byers ¾ yard model 83, weighing 36,000 lbs. as a chain or cable crowd, gas or diesel shovel, convertible excavator.

## Chain Belt Co.



Rex double pumpcrete. Included in the exhibit would have been Rex concrete mixers, Rex speed prime pumps, Rex Moto-mixers, Rex plaster and mortar mixer, and the Rex duomatic paver.

## The Cleveland Rock Drill Co.



Improved drill rig with two jack screws, geared together, for raising and lowering the U-bar and feed mechanisms. A complete line of rock drills, paving breakers, backfill tampers, pneumatic digger, and accessories would be shown.

## AED Convention Largest in Its History

The Associated Equipment Distributors' 23rd Annual Convention held at the Edgewater Beach Hotel in Chicago, Jan. 12th-14th was the largest in the history of the organization. The list of registrations totaled 626. Of this number 302 were AED members. The others were non-members and guests.

The following officers and directors were elected to serve until January, 1943:

President—T. W. Harron, Harron Rickard & McCone Co., San Francisco, Calif.

1st Vice-President—Ed. P. Phillips, Phillips Machinery Co., Richmond, Va.

2nd Vice-President—G. W. Van Keppel, G. W. Van Keppel Co., Kansas City, Mo.

3rd Vice-President—H. O. Penn, H. O. Penn Machinery Co., New York, N. Y.

Treasurer—R. R. Nixon (reelected), Nixon, Hasselle Co., Chattanooga, Tenn.

Executive Secretary—C. F. Winchester (reappointed), National Press Building, Washington, D. C.

Director, Region 1—Wm. Danner, Parker-Danner Co., Boston, Mass.

Director, Region 2—H. O. Penn, H. O. Penn Machy. Co., New York, N. Y.

Director, Region 3—James C. Alban, Alban Tractor Co., Baltimore, Md.

Director, Region 4—Ed. P. Phillips, Phillips Machinery Co., Richmond, Va.

Director, Region 5—A. E. Hahnan, Tractor & Machy. Co., Atlanta, Ga.

Director, Region 6—Chas. O. Finn, Finn Equipment Co., Cincinnati, O.

Director, Region 7—B. C. Patten, Patten Tractor & Equipt. Co., Chicago, Ill.

Director, Region 8—G. W. Van Keppel, G. W. Van Keppel Co., 2440 Pennway, Kansas City, Mo.

Director, Region 9—R. S. Rosholt, Thorman W. Rosholt Co., Minneapolis, Minn.

Director, Region 10—Geo. A. Cooper, J. E. Ingram Co., San Antonio, Texas.

Director, Region 11—T. W. Harron, Harron, Rickard & McCone Co., San Francisco, Calif.

Director, Region 12—Frank B. McBath, Columbia Equipment Co., Portland, Ore.

President Harron appointed members on the Board of Governors as follows:

Chairman W. G. Morgan (immediate past president), Geo. F. Smith Co., St. Louis, Mo.

A. F. Sersanous, Loggers & Contractors Machinery Co., Portland, Ore.

J. S. Gilman, Wm. F. Ziegler Co., Minneapolis, Minn.

M. R. Hunter, Hunter Tractor & Machinery Co., Milwaukee, Wis.

G. F. Lowe, Lowe Machinery Co., Chicago, Ill.

F. W. Mattheis, Hedge & Mattheis Co., Boston, Mass.

R. R. Nixon, Nixon-Hasselle Co., Chattanooga, Tenn.

The office of third vice-president was created following an amendment to the by-laws at the meeting.

In addition to the chairmanship of the board of governors, Mr. Morgan was appointed chairman of a newly created Federal Relations Committee.

Among the speakers at the convention were:

Capt. R. L. Richardson, U. S. Army.

B. T. Bonnot, OPM.

H. K. McCook, OPM.

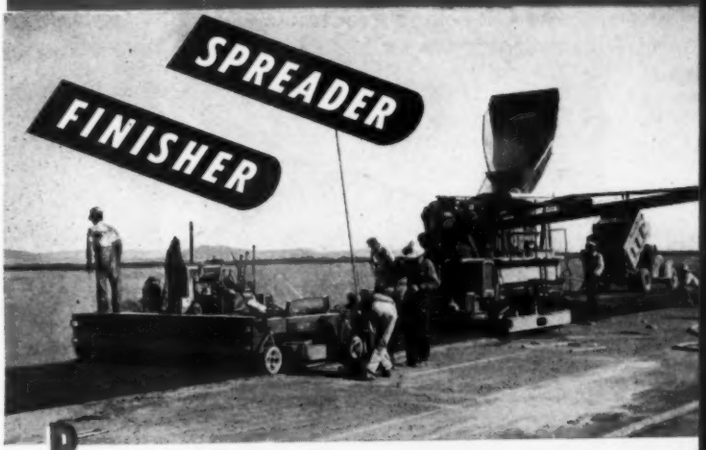
Joe Dean, OPA.

D. W. Kimball, president-elect, Associated General Contractors of America.

*(Continued on page 71)*

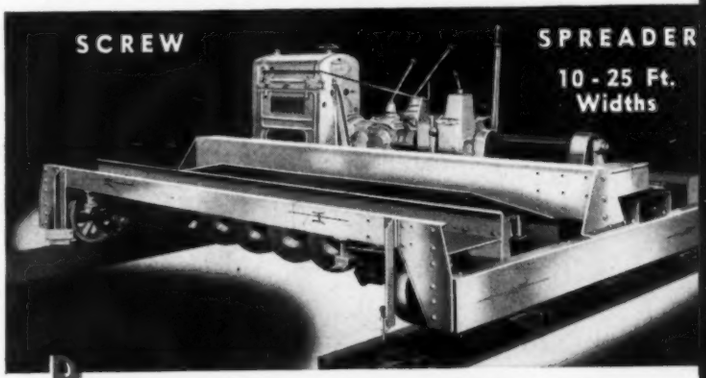

*On Vital Roads and Airports,*

**THIS JAEGER TEAM**



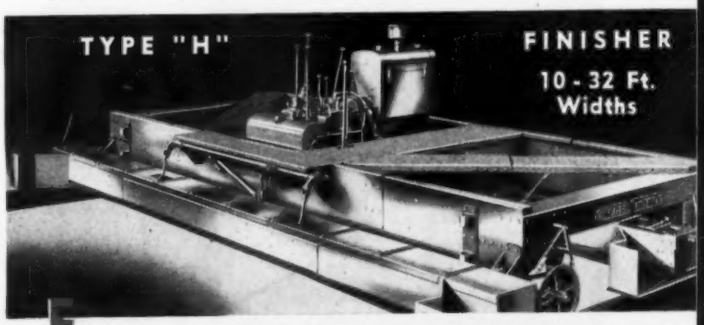

**PAVES AS FAST AS MODERN DUAL DRUM OR TANDEM PAVERS CAN PRODUCE . . .**

This "mechanized method," originated by Jaeger, has made it possible for contractors to spread and finish the harsh, dry mixes of today up to the full capacity of 34E dual drum or multiple pavers and in any standard width from 10 to 25 ft. A *necessity* with big pavers — an *advantage* with any paver, big or small.




**REMIXES, SPREADS, ADDS DENSITY, STOPS SEGREGATION — VIBRATION IF DESIRED . . .**

Easily spreads maximum paver production even in 10 ft. widths — strikes off base for steel, top for final finishing. Action of Jaeger Screw increases density and uniformity — the only method that guarantees against segregation. One operator replaces crew in pit




**FINISHES WITH SPEED AND SMOOTHNESS THAT CUT JOB COSTS TO THE MINIMUM . . .**

Unmatched for flexibility of speed and power, ease and completeness of control. Direct lever movement controls any function — 4 traction speeds — independent screed speeds, hydraulic screed lifts. "Velvet touch" smoothness saves on floating and hand work. Telescopic width changes up to 4 ft. Vibratory models give deep, internal vibration, the Jaeger method that insures maximum uniform density

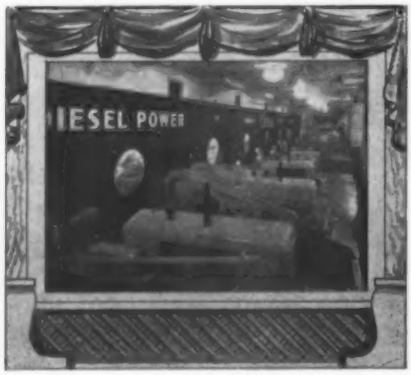
Send for Complete Catalog and Data

**THE JAEGER MACHINE COMPANY**

223 Dublin Ave., Columbus, Ohio

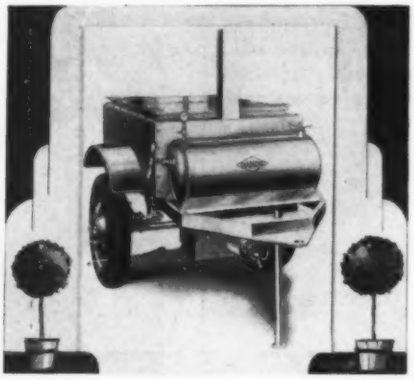
Concrete-Bituminous Paving Equipment, Mixers, Pumps, Hoists, Towers, Truck Mixers

## The Cleveland Tractor Co.



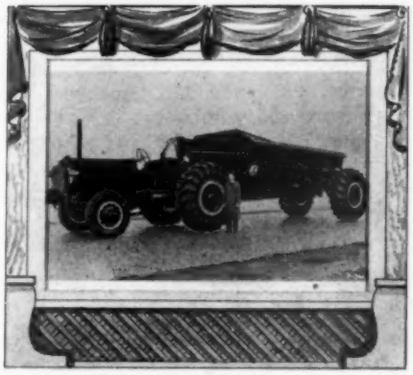

A picture of one of the Cletrac road show exhibits.

## Diamond Iron Works, Inc.



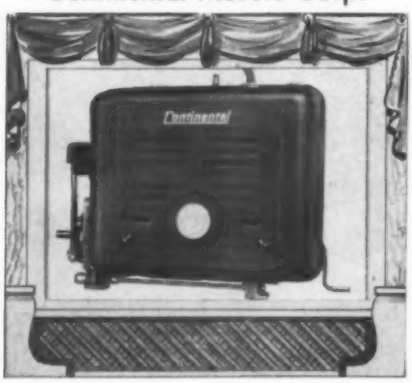
Portable tar and asphalt kettle. Also shown would be rock, sand and gravel crushing screening, conveying units, and portable crushing plants.

## The Euclid Road Machinery Co.



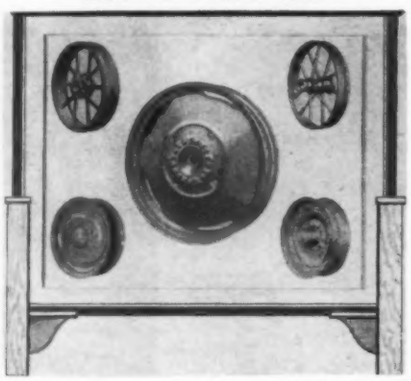
Bottom-dump Euclid struck measure capacity—21 cubic yards. Other Euclids of this type with struck measure capacities of 9 and 13 cubic yards, and rear-dump Euclids in 10 ton and 15 ton capacities would be featured.

## Continental Motors Corp.



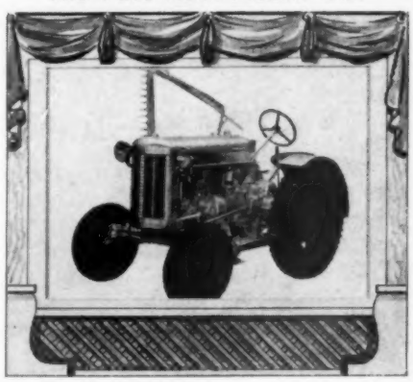

Model F226 Red Seal Continental with 226 cubic inch displacement—3-5/16" x 4⅜". This model is only one in line ranging from 69 to 501 cubic inches.

## Electric Wheel Co.



"Electric" steel wheels. In addition to these, many other sizes and types would have been shown, also trailers and mountings for compressors, pumps, motor generator sets and similar portable industrial machinery.

## The Fate-Root-Heath Co.

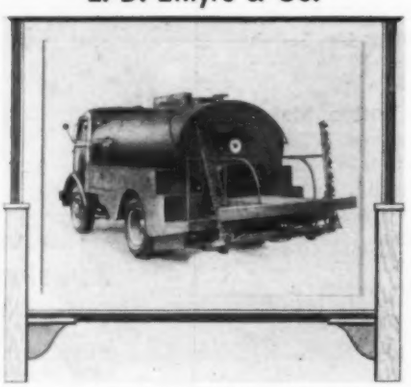


The Silver King hiway motor has a wide cutting range and is flexible in performance. Designed so that snow plows and other equipment can be attached. It has a highway speed of 25 miles per hour.

## Dempster Bros.

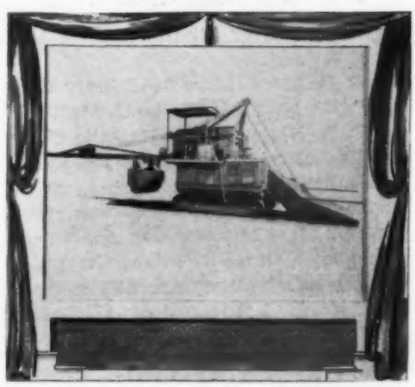
Dempster-Dumpster-Bucketrux with detachable body—4 cubic yard drop-bottom type —in carrying position.

## E. D. Etnyre & Co.



Etnyre "Black Topper" bituminous distributor. Other models with front or rear engine drive in streamlined or semi-streamlined design would be shown.

## The Foote Co.



Multifoote concrete paver. Also featured would be single drum 27-E and 34-E concrete pavers and the Adnun black top paver for road and airport paving.

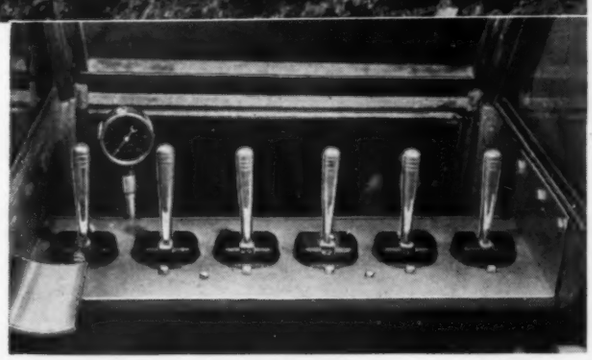
# Clipper Shovel Operators Lead the Life of Reilly!

Buckeye Trench Hoe speeds excavations, roughing out sewers and big trench at 4th Armored Division's Pine Camp — facilities for 15,000 men, project covers 16,000 acres, near Watertown, N.Y.

## yet average more yards on every shift

The Buckeye Clipper's Mevac (metered vacuum) Power Control makes shovel operating a "white collar" job. Six "palm fitting" handles — grouped with those used most in easiest reach — do the job smoothly and quickly, guiding the shovel through its work cycle. And yet the "feel" is as sensitive as on old steam rigs.

Upholstered operator's seat, arm rest, 215° clear view — *no wonder operators deliver plus yardage right up to the end of the shift.*



Vacuum Power Control saves for you, too, Boss — ask the maintenance men of those that own them. No leaky pressure lines, no mechanical jamming and jerking, longer clutch lining life, longer rope wear, all-season operation — there's nothing to condense or freeze in the Mevac System, no linkage troubles. And vacuum control is *only one of 24 preference points!*

The Clipper is tomorrow's shovel today. They're cutting costs *everywhere* for contractors, pits, quarries, material yards and municipalities. Three models

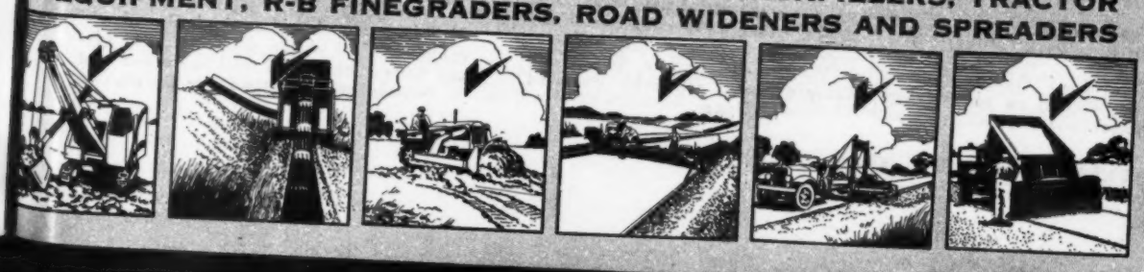
| The "50" | The "60" | The "70" |
|---|---|---|
| ½ yd. | ⅝ yd. | ¾ yd. |

Quickly convertible to crane, dragline, trench hoe, pile driver — gasoline or diesel powered.

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO

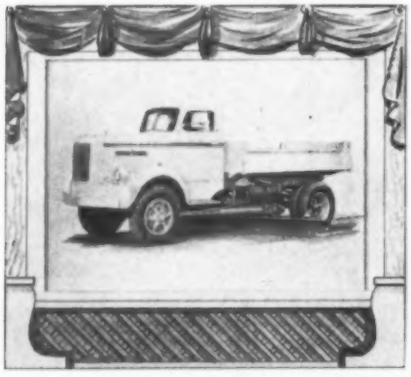
## Built by Buckeye

CONVERTIBLE SHOVELS, TRENCHERS AND BACKFILLERS, TRACTOR EQUIPMENT, R-B FINEGRADERS, ROAD WIDENERS AND SPREADERS



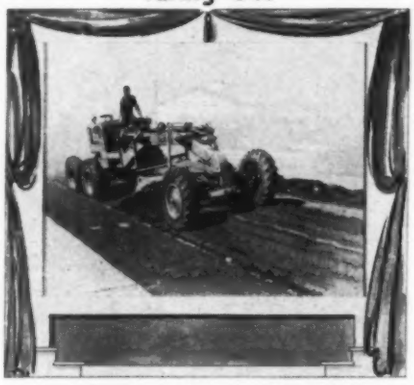
CHECK PAGE 27

## The Four Wheel Drive Auto Co.



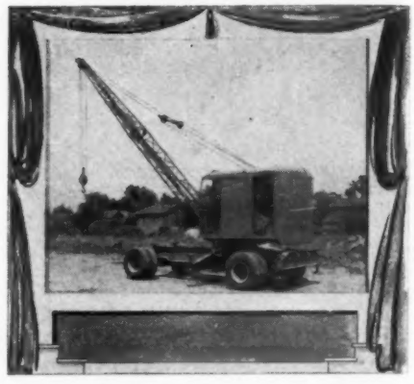
FWD model "HG" maintainer. Designed for patrolling roads, plowing snow, and hauling loads. This new model features FWD-built axles, and four-wheel-drive power and performance.

## Galion Iron Works & Manufacturing Co.



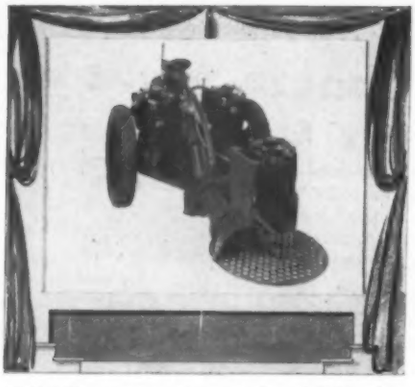
Galion No. 101 motor grader blading a street preparatory to resurfacing. Also shown would have been a 3-wheel, tandem and portable roller.

## The General Excavator Co.



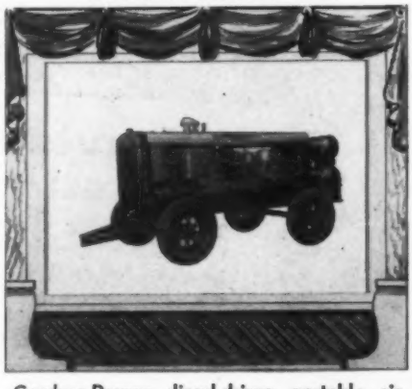
The new General supercrane, self propelled, hydraulically steered, one-man-operated, and mounted on rubber tires. It is interchangeable as crane, clamshell, dragline or pile driver.

## Fuller Co.



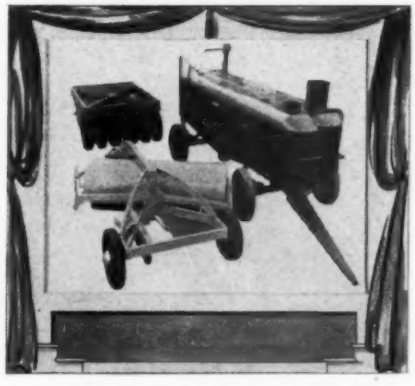
Fuller-Kinyon remote-control unloader for unloading Portland cement in bulk from box cars, barges, ships and flat-bottomed storage bins. Built in capacities from 100 to 450 barrels per hour.

## Gardner-Denver Co.



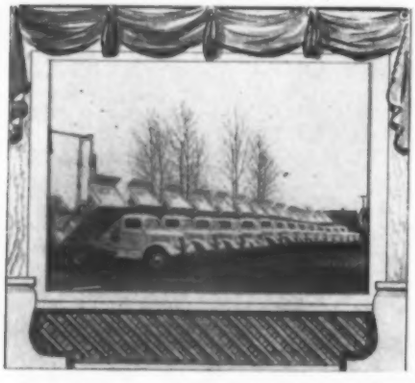
Gardner-Denver diesel-driven portable air compressor, mounted on pneumatic tires. In addition, the Gardner-Denver wagon drill, and complete line of hand held drills would be exhibited.

## W. E. Grace Manufacturing Co.



Grace 10 tired pneumatic roller, Grace two-way axle driven road sweeper, and rapid fire circulating heater for tank cars of asphalt—complete with auxiliary steam equipment.

## The Galion Allsteel Body Co.

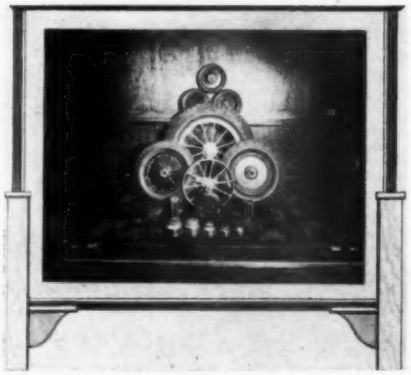


A representative partial fleet of Galion heavy duty hydraulic hoists working on an important project.

## Gar Wood Industries, Inc.

Gar Wood hydraulically-operated road-builder and Allis-Chalmers tractor. Other machinery displayed would have included a Gar Wood 4-wheel scraper, a Gar Wood 2-wheel scraper, a Gar Wood bulldozer and roadbuilder, and both a Gar Wood hydraulically operated and cable operated ripper.

## The Geneva Metal Wheel Co.



Manufacturers of rubber tired disc wheels, spoke-tite steel wheels, accessories and special parts, rubber tired steel spoke and cast wheels, and steel tired disc wheels.

(Continued from page 67)

Chas. M. Upham, Engineer-Director, American Road Builders' Association.

S. Morris Livingston, U. S. Department of Commerce.

Lion Gardiner, Jaeger Machine Co.

Walter Gardner, Keystone Steel & Wire Co., was the speaker at the Manufacturers Luncheon.

Generally acknowledged to be one of the outstanding papers read at the convention was that by Harry Fletcher of New Orleans, "The Distributors Contribution to National Defense." The highlight of Mr. Fletcher's talk was the listing of 14 detailed phases of service rendered by equipment distributors. The essence of the 14 phases was that a distributor is a construction and industrial equipment engineer engaged in the application and maintenance of that type of equipment currently on war projects. Mr. Fletcher, referring to an incomplete survey conducted by AED, stated 37 per cent of the membership have 2,946 employees and have an invested capital of over 19 million dollars. The same group reported total annual sales of over 74 million dollars.

The Association gained 15 new regular, 4 new allied and 2 new associate members during the convention, bringing the totals to 250 regular, 5 associate and 96 allied.

## Road Builders Mobilize

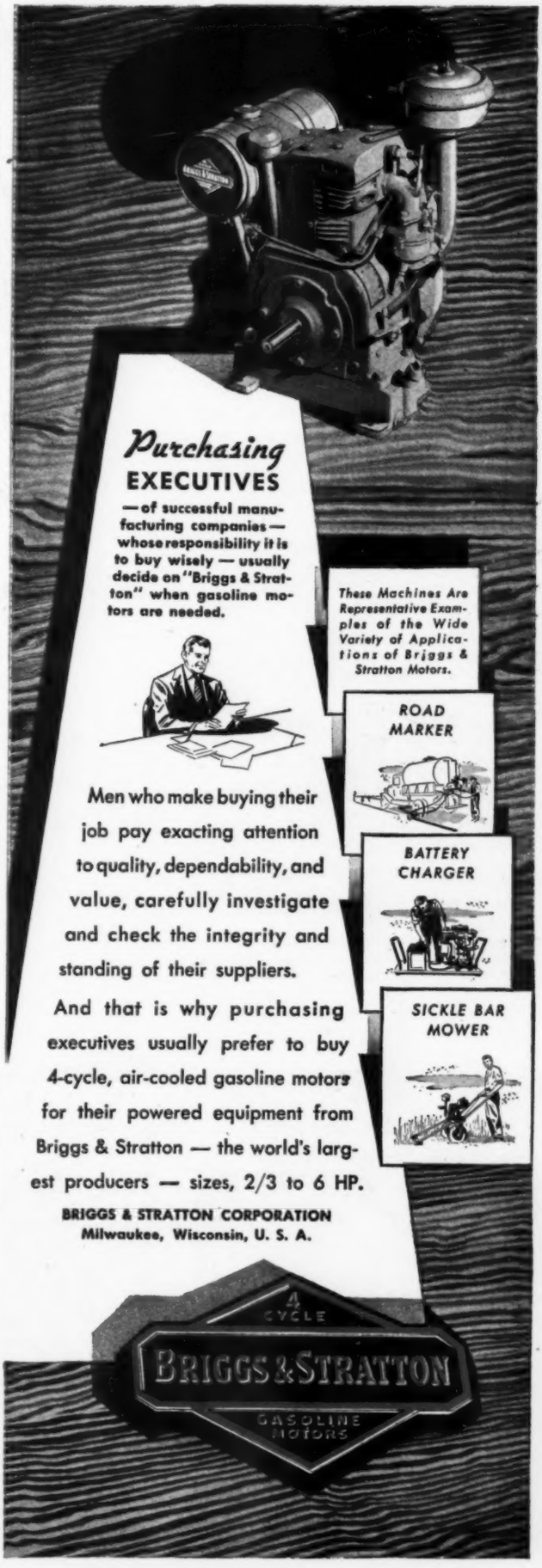
The road builders of America will mobilize in Memphis, Tenn., March 2, 3, 4 and 5, at the Defense Highway Congress of the American Road Builders' Association. General headquarters will be the Peabody Hotel and, with "Roads to Victory" as theme note, congress sessions will designate the role that each and every member of the highway industry and profession is expected to play in Uncle Sam's war effort.

Contained in a recently released official statement, an ARBA victory pledge reads, "Road builders are at war. Our No. 1 job is victory, To the all-out cause of Uncle Sam—we pledge our full load of talents. To the monumental task ahead—we declare ourselves ready, willing and able. To the threat of tremendous handicaps—we resolve that the job shall be done with speed, economy, soundness and patriotism."

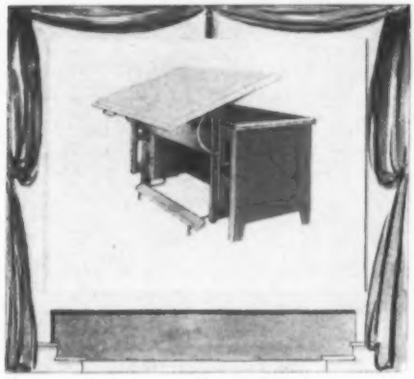
Congress "Sessions on Service" will deal with wartime construction, defense construction progress, availability of equipment, priorities and allocation, post-war public works, secondary roads and local agencies, availability of materials, the Latin American program, the future of federal aid, access roads, airports, wartime maintenance, strategic network development, the Inter-American Highway, the future of the contract system, civilian road defense and wartime public relations. Army, navy and civilian authorities will lead all discussions about wartime fundamentals. For instance, T. Semmes Walmsley, deputy director, Office of Civilian Defense and ex-mayor of New Orleans, will be on hand to stress "Civilian Road Defense" from the standpoint of road-builder participation on a national basis.

One full congress day will be devoted to a question-and-answer program, patterned after "Information Please," with a battery of experts to answer every delegate's barrage of queries about individual problems. To chart the course of the association for the year ahead, the business meeting will be held during congress week.

Entertainment highlights will be the Road Builders' Victory Banquet and the Old Timers' Reunion. Banquet "surprise" will be "what you want to hear, by the man you want to know, from the top defense agency in Washington." The scene will be the grand ballroom of the Peabody Hotel, Tuesday night, March 3, at 7:30 o'clock, and, at that time, Alabama Highway Director Chris J. Sherlock, first southerner to be so honored, will be recognized as new president of the American Road Builders' Association.

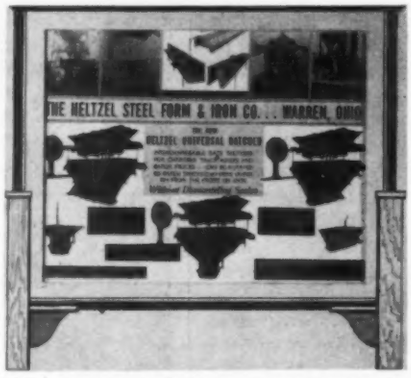

Purchasing
EXECUTIVES
—of successful manufacturing companies—whose responsibility it is to buy wisely — usually decide on "Briggs & Stratton" when gasoline motors are needed.
These Machines Are Representative Examples of the Wide Variety of Applications of Briggs & Stratton Motors.
ROAD MARKER
BATTERY CHARGER
SICKLE BAR MOWER
Men who make buying their job pay exacting attention to quality, dependability, and value, carefully investigate and check the integrity and standing of their suppliers.
And that is why purchasing executives usually prefer to buy 4-cycle, air-cooled gasoline motors for their powered equipment from Briggs & Stratton — the world's largest producers — sizes, 2/3 to 6 HP.
BRIGGS & STRATTON CORPORATION
Milwaukee, Wisconsin, U. S. A.
4 CYCLE
BRIGGS & STRATTON
GASOLINE MOTORS

## Hamilton Manufacturing Co.



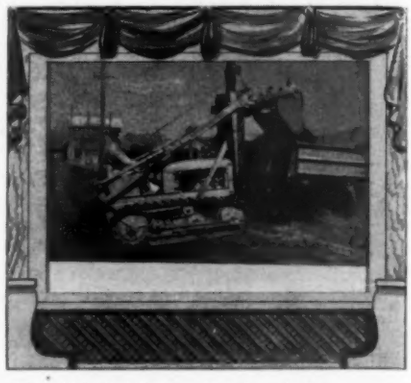
New improved Hamilton auto-shift drawing table. The latest types of wood and steel drawing tables of all models, and filing equipment for horizontal, roll, and vertical filing would have been included.

## The Heltzel Steel Form and Iron Co.



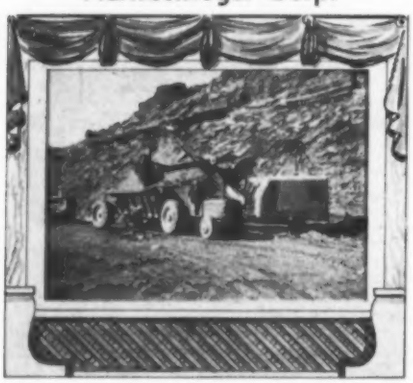

The new Universal batcher can be installed on any Heltzel batching plant now in service, or on any type plant with comparable size gate openings.

## Frank G. Hough Company



Hough hydraulic tractor shovel shown on a model "M" A-C tractor. Also on exhibition would be Hough road sweepers, road blowers and combination sweeper-blowers, Hough motor street sweepers, and Hough backfiller blades

## Harnischfeger Corp.

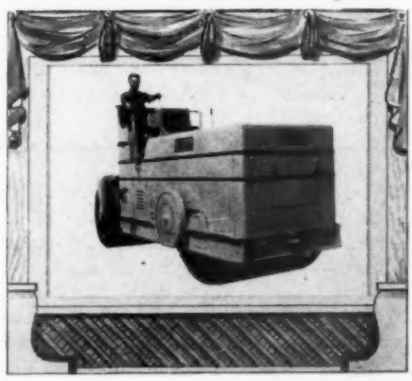


P&H excavator with a capacity of 2 cubic yards equipped as a shovel. New features are fully hydraulic control, three-bearing jackshaft, full circle of 360° brakes, live roller circle, and all welded construction of alloy steels.

## Hercules Motors Corp.

Two models of Hercules power units.

## The Huber Manufacturing Co.



Huber roller. A complete line of automotive type road rollers, variable weight tandem rollers, model "BG" maintainers, industrial tractors, and motor graders with dual or tandem drive would be shown.

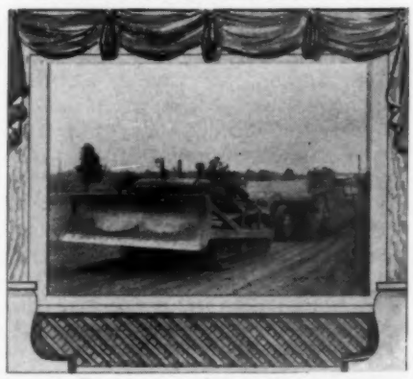
## The Heil Company

Heil hi-speed scoop. Besides this new combination tractor-scoop other units would have been featured such as: cable scoops up to 25 yards capacity, trailbuilders, bulldozers, and tamping rollers.

## Hercules Steel Products Co.

Hercules speedraulic hoist mounted with type RB Hercules rock body. Included in the exhibit would have been a Hercules tire and tool pack dump body and various models direct, dual and side drive split shift power take-off units.

## International Harvester Co.



International crawler TracTracTor equipped with 10-foot 6-inch bulldozer operating a 10-yard scraper. A wide variety of International tractors, motor trucks, and power units would also be displayed.

Only 8 of 17 Points for —

# HAZARD LAY-SET *Preformed*

PREFORMED WIRE ROPE

4. The load on a PREFORMED wire rope is distributed equally to each strand, and to each wire in every strand. The rope is safer under load, lasts longer and maintains the safety factor better.
5. When outer wires break they do not stand up from the surface of the rope to injure workmen, sheaves and the rope itself.
6. PREFORMED wire ropes are installed with greater ease and in shorter time.
7. PREFORMED wire ropes are "pre-broken-in."
8. PREFORMED wire ropes, in stretching, do not suffer change in length of lay. Strands are merely bedded firmly to the core.
9. PREFORMED wire ropes do not rotate in the sheaves to the same extent as non-preformed ropes.
10. PREFORMED wire ropes resist the whipping associated with vibration.
11. PREFORMED wire ropes permit more "fool proof" attachment of sockets, helping workmen to attach the sockets without unbalancing the rope lays below the socket bases.

Worn PREFORMED wire rope is safer to handle — does not "porcupine" — men handle it faster

PAGE 87

*This is a page reproduced from the Machinery's Wire Rope Data Book — America's No. 1 reference on wire rope, its manufacture, construction, care and use. It lists 17 points of superiority for the preformed type of wire rope.*

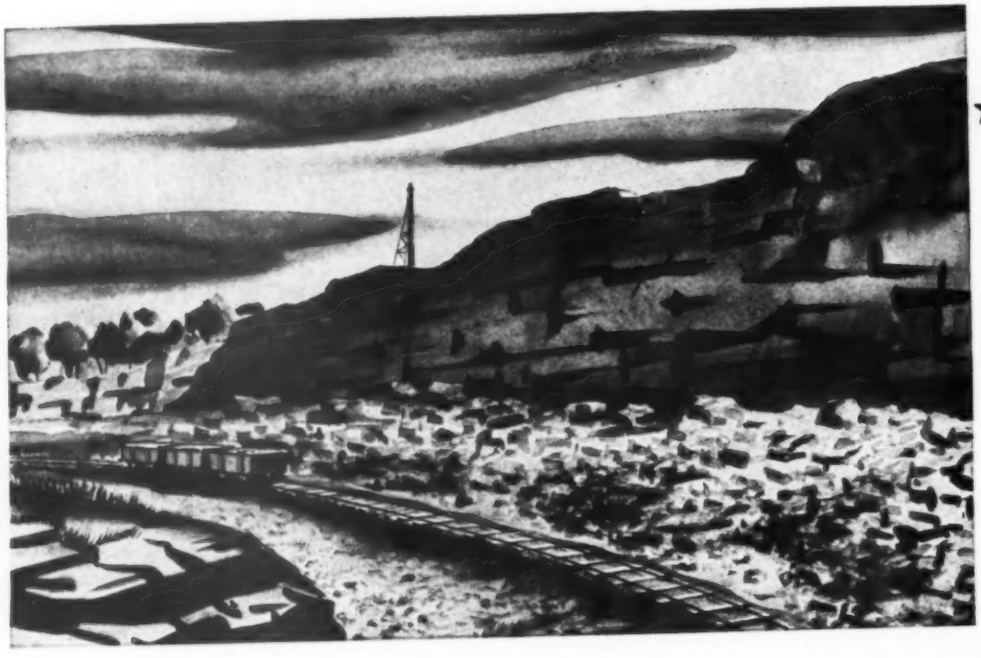
● Being preformed (and the *first* rope to be preformed under the assigned patents) Hazard LAY-SET has repeatedly proved up on all seventeen points in practically all applications. LAY-SET PREFORMED is backed by 96 years of rope-making experience and by a company that has clung so tenaciously to quality materials, manufacture and service that it has on its books many firms who have used Hazard ropes continuously for 40, 50 and 60 years. All Hazard ropes identified by the Green Strand are made of Improved Plow Steel.

HAZARD WIRE ROPE DIVISION
WILKES-BARRE, PENNSYLVANIA

AMERICAN CHAIN & CABLE COMPANY, INC., BRIDGEPORT, CONN.
District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Worth, San Francisco, Denver, Los Angeles, Atlanta, Tacoma

GREEN SIGNIFIES SAFETY

HAZARD LAY-SET *Preformed* WIRE ROPE



★ ★ ★ ★

# Confidence

## BUILT THROUGH DEPENDABLE SERVICE

AMERICAN
EXPLOSIVES

★ ★ ★ ★ ★ ★

THE policy of American Cyanamid & Chemical Corporation is to manufacture explosives and blasting supplies of the highest quality, and to supplement them with competent research and technical services to the end that industry may profit by their use.

These services begin in the research laboratories and at the plants.

Modern laboratories have been provided for accurate control of processes and products. Research is carried on continuously by trained chemists on problems pertaining to the manufacture and use of explosives and blasting supplies. Plants are located at points near the sources of raw materials and convenient to the industries they serve.

Competent sales representatives are at your call for discussions in connection with deliveries or blasting problems. Supplementing the sales force, a group of engineers trained in the use of explosives is available for consultation on the problems of mining, quarrying, construction projects and other applications of these products.

Distributing magazines are located at strategic points. These are under the care of personnel trained in the handling of explosives. It is their responsibility to properly care for stocks and maintain facilities which enable them to render prompt delivery service.

The consummation of these carefully planned steps results in consumer "Confidence Built Through Dependable Service."

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**PERMISSIBLES**
**BLASTING POWDER**
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Defense materials and parts must be trucked to keep Industry's wheels turning. Guns, troops and supplies must move swiftly to threatened points.

Snow-blocked highways that stop our motor transportation and bog down our motorized Army units, are costly "detours" on America's road to victory.

Clear the way with WALTER SNOW FIGHTERS! Put the tremendous power and traction of Walter 4-Point Positive Drive on the job. Get your highways open faster—clear more miles per truck—plow through the highest drifts with irresistible force.

Walter 4-Point Positive Drive provides FOUR powerful driving wheels with torque automatically proportioned to each wheel according to its traction at any instant, providing a steady, unfailing source of power.

From radiator to rear light, WALTER SNOW FIGHTERS are designed and constructed to withstand the punishing work of snow removal. Write for detailed literature explaining the features that make this unusual performance possible.

## WALTER MOTOR TRUCK CO.

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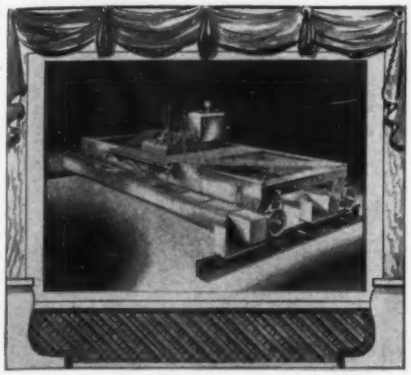
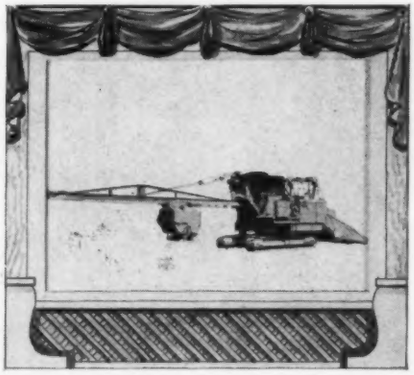
# WALTER 4-POINT POSITIVE DRIVE SNOW FIGHTERS

## Jaeger Machine Co.



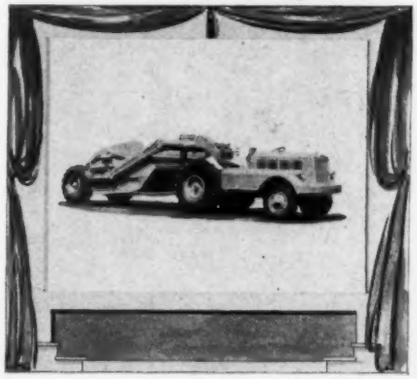
"H" Jaeger-Lakewood finisher, featuring automotive transmission in front of engine. Other items exhibited would be the Jaeger screw spreader, bituminous paver, form tamper, extra gauge road forms, truck mixers, pumps, and concrete mixers.

## Koehring Co.



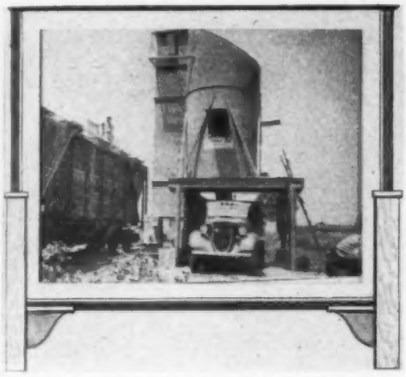
Koehring 34E Unibatch paver. The Koehring and Kwik-Mix display would include power shovel, crane, dumptor, trail-dump, wheeler, longitudinal finisher, mud jack, Dandie mixer, and the Kwik-Mix tilting mixer.

## La Plant-Choate Mfg. Co.



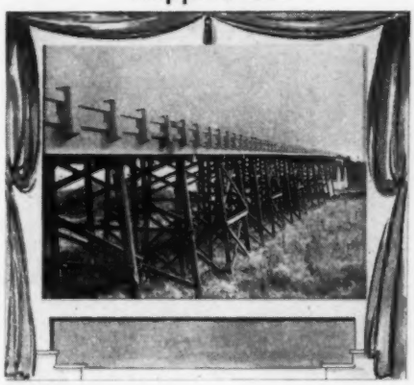
The LaPlant-Choate CW-10 "Carrimor" scraper and "Caterpillar" diesel DW-10 tractor. A high speed, long haul, hydraulically operated 10 cubic yard unit.

## The C. S. Johnson Co.



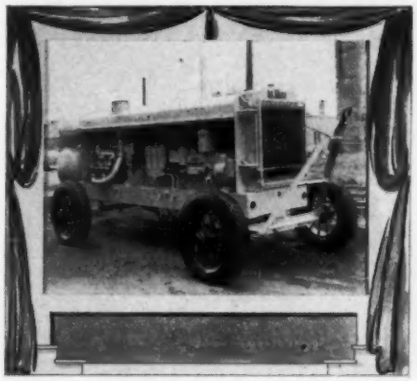
The Johnson Dutch Mill bulk cement plant for use with hopper bottom box car or bulk truck cement delivery. Other items featured would be Johnson's new elevating cement charger, and central mix plants.

## Koppers Co.



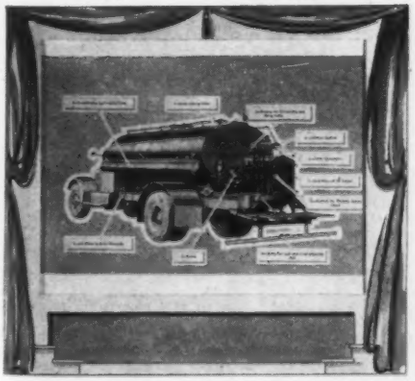
Wooden bridge of pressure-treated timber. Pressure-treated guard-rail posts, highway marker posts, laminated grade crossings, cribbing and prefabricated culverts would also have been shown with Tarmac paving, pitch and felt roofing and waterproofing.

## Le Roi Co.



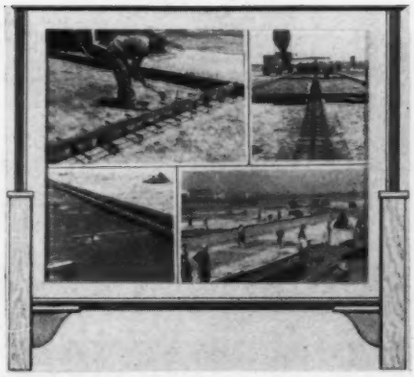
Le Roi diesel driven, portable air compressor. Besides this and portable air compressors driven by Le Roi gasoline engines, also shown would be a complete line of gasoline, natural gas, or butane burning engines from 4 to 400 H.P.

## Kinney Manufacturing Co.



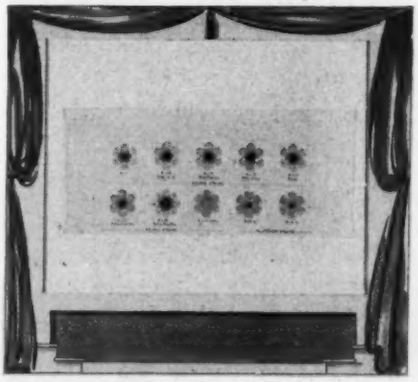
Kinney distributor. Besides this, the Kinney steam jacketed pump with motor drive and steam jacketed suction strainer for asphalt, and the Kinney improved type spray nozzles for distributors would be shown.

## Laclede Steel Co.



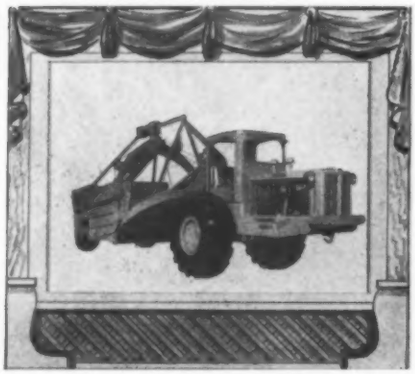
Dowel spacers, recess joint, and wire mesh. A complete line of wire mesh, dowel assemblies, joints, and accessories used to reinforce pavement would have been shown.

## A. Leschen & Sons Rope Co.



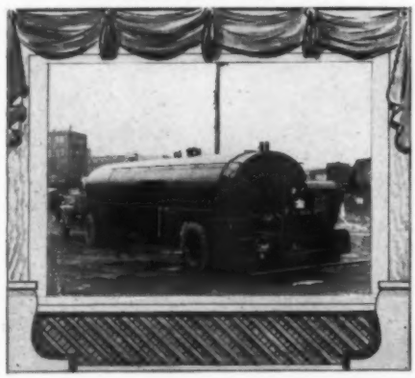
Cross section views of some of the constructions in which "Hercules" (Red-Strand) wire rope is furnished for use on various kinds of road building equipment. Various wire rope samples would have been shown.

## R. G. Le Tourneau Inc.



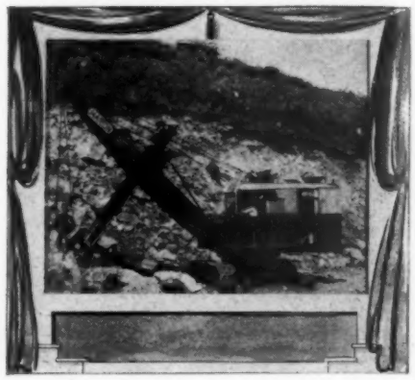
Super "C" Tournapull with "LP" carryall scraper. In addition to this unit, the LeTourneau Model "NP" carryall scraper, LeTourneau power control unit, and Angledozer for "Caterpillar" tractors, would have been shown.

## Littleford Bros. Inc.



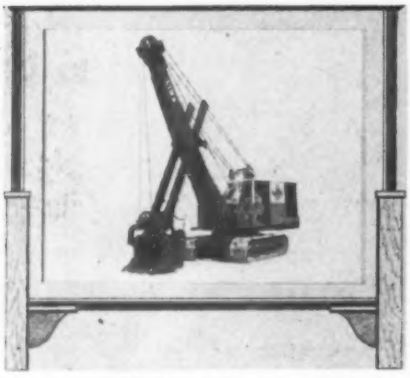
Frameless construction — Littleford "Spray Master" pressure distributor model CLR, 4000 gallon semi-trailer. Other items shown would be Littleford road brooms, "Tanker" heaters, tar kettles, supply tanks, and utility spray tanks.

## The Marion Steam Shovel Co.



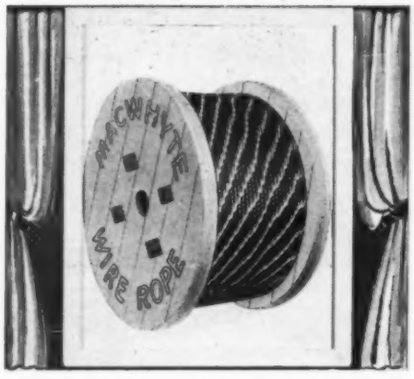
Marion type 362 1½ cubic yard shovel. Other equipment that might be shown would be the Marion dragline, crane, clamshell, and pullshovel—either gas, diesel or electric powered.

## Lima Locomotive Works, Inc.



Lima type 750 shovel, equipped with 22' boom, 17' dipper handle, and 1¾ yard dipper. Also displayed would have been the Lima ¾ yard Super-Paymaster.

## Macwhyte Company




Wire rope for excavating equipment, preformed and internally lubricated. Two types of wire would be featured in Monarch Whyte strand preformed excavator ropes to provide maximum tensile strength, abrasion resistance, flexibility and toughness.

## Michigan Power Shovel Co.

Michigan model TLCT-16 mobile shovel-crane, ½ yard capacity. Dual tandem drive. Michigan model T6-D mobile shovel-crane, ⅜ capacity, single axle drive would also have been shown.

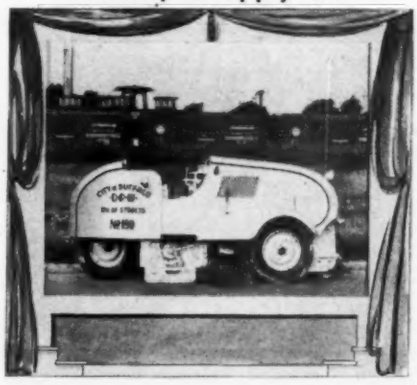
## Link-Belt Speeder Corp.

Link-Belt speeder shovel equipped with Speed-o-Matic hydraulic power control. Complete line exhibited would include 21 models, ranging from ⅜ to 3 yard capacity — shovels, draglines, cranes — crawler and truck-mounted.

## Mall Tool Co.

One of Mall Tool Company's latest booths showing various types of equipment.

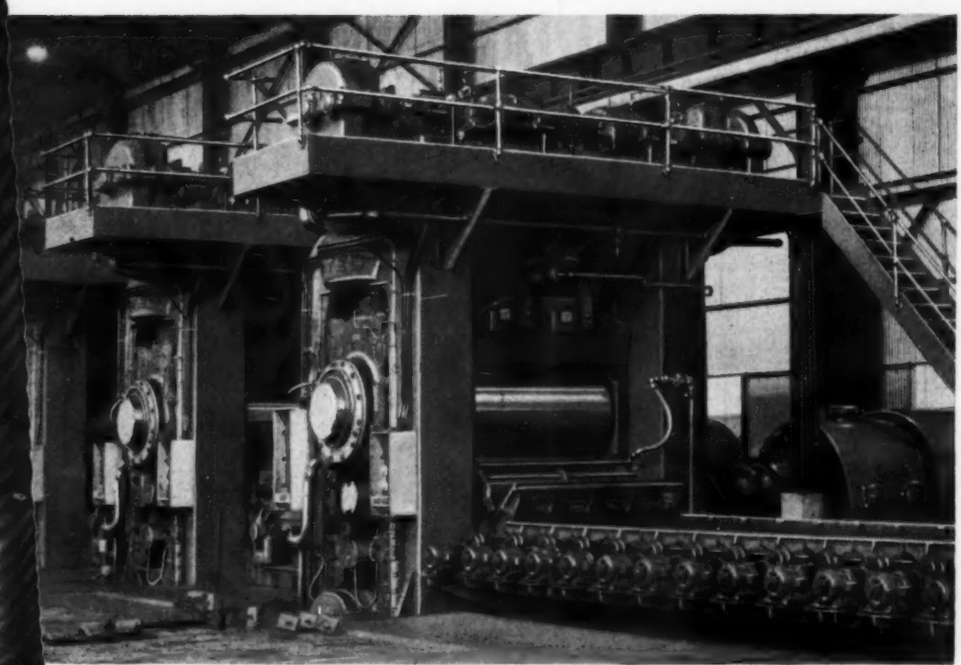
## Municipal Supply Co.



Gutter-snipe pickup street sweeper. A complete line of street flushers, street sprinklers, bituminous distributors, bituminous maintenance units, and traffic line markers would have been exhibited.

# 64 Years' Experience

## IN MAKING QUALITY STEEL SHEETS...



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OVER 60 years of working with metal... much of that time devoted to metallurgical research on rust and corrosion resistance alone! That's the valuable background Granite City Steel Company brings to the manufacture of famous Granitiron Culvert Sheets. No wonder highway officials, contractors, and engineers give these sheets the call so unreservedly and so often. Extra durability, extra strength and dependable service are the qualities they look for—and obtain—in Granitiron Culverts.

**FREE!** Send today for this book of facts about culverts. It can help you solve drainage and water control problems!

**GRANITE CITY STEEL COMPANY**

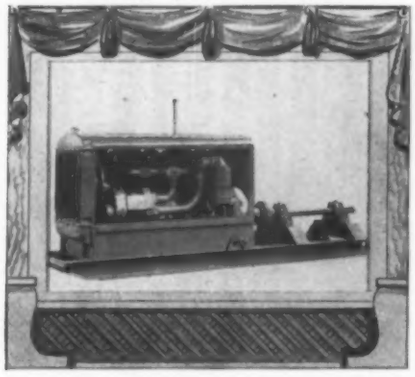
SINCE 1878 — GRANITE CITY SHEETS

CULVERT DIVISION

GRANITE CITY ILLINOIS

*...For Dependable...* PURE IRON GRANITIRON COPPER BEARING *...Lifetime Service...*

## Murphy Diesel Co.

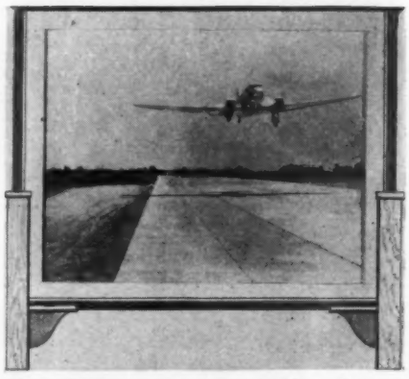


Murphy diesel supercharged six cylinder 5¾ x 6½ enclosed power unit. Other models would have been shown as well as self-contained diesel electric generator sets.

## The Osgood Co.

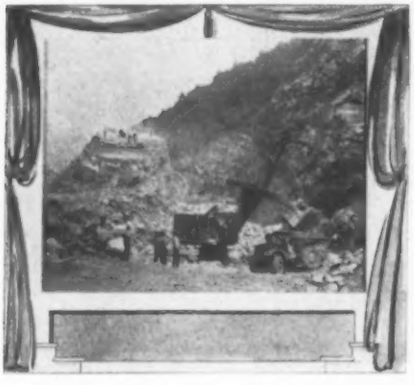
New Osgood air control shovel. Also available as a mobilcrane. Besides this, a conventional 10 ton, 3 wheel roller with the "Ironeroller" attachment would be shown.

## Portland Cement Assn.



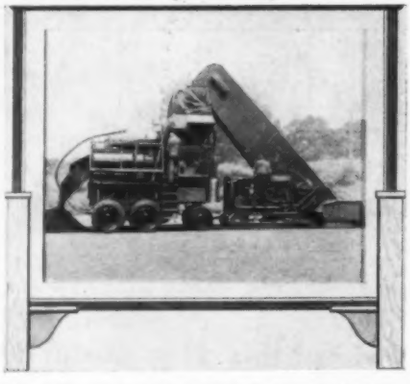
Concrete runway pavement. Also, the use of concrete in national defense, particularly for airport runways, and for access or strategic highways would have been featured.

## Northwest Engineering Co.



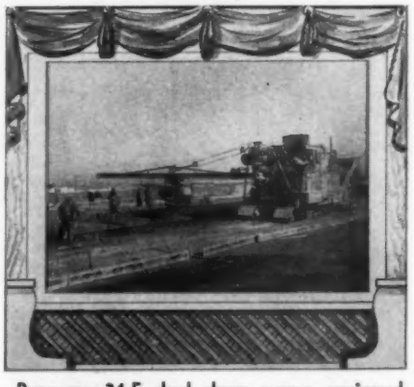
Northwest shovel, 1½ yard capacity, available with either gasoline, diesel or electric power. Other sizes ⅜ yard capacity and larger.

## Pioneer Engineering Works



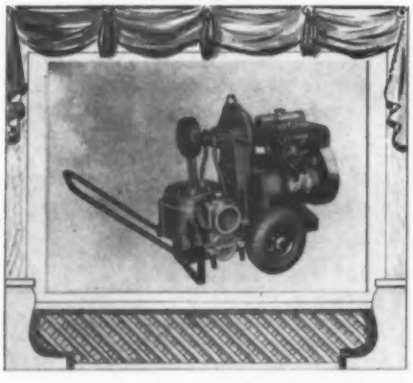
The Pioneer travel-mix plant for production of bituminous and stabilized material for road and airport surfacing.

## The Ransome Concrete Machinery Co.



Ransome 34-E dual drum paver equipped with the new hydraulically operated boom bucket.

## Novo Engine Co.

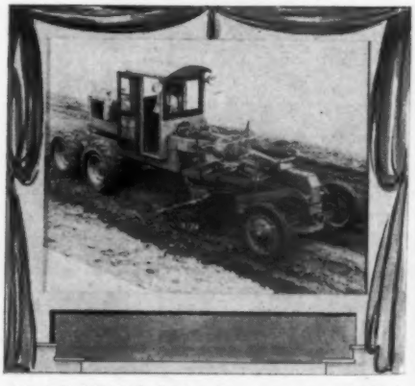


Novo diaphragm pump 8,000 gph capacity. Complete line of self-priming centrifugal pumps, pavement breaker, light plants—1 to 10 kw, AC and DC, and hoists would be shown.

## Pittsburgh Steel Co.

Pittsburgh safety highway guard. Also shown would be welded wire reinforcement for roads, concrete pipe, and other construction.

## W. A. Riddell Corp.



Model UD-140 hydraulic power controlled diesel powered motor grader.

## SISALKRAFT CURING is at Work on Big Airport and Highway Jobs Throughout the Nation

The photo above is typical, these days. It shows the concrete runways of a vast west coast airport being cured under Sisalkraft blankets. Note only two men are required to unroll the blankets immediately behind the finisher.

Sisalkraft is completely waterproof, amazingly tough and durable. It's the standard paper for concrete curing — and as the photos at right indicate, it has numerous other applications.

(Top) Acres of Sisalkraft blankets on a soil cement job for protection of pulverized soil and for final curing. (Bottom) Blankets protecting cement sacks piled on the job. (Center) Used to close in for winter work and steam curing.

SISALKRAFT is available for jobs essential to the national war program — in rolls and blankets to fit any job. Write for data.

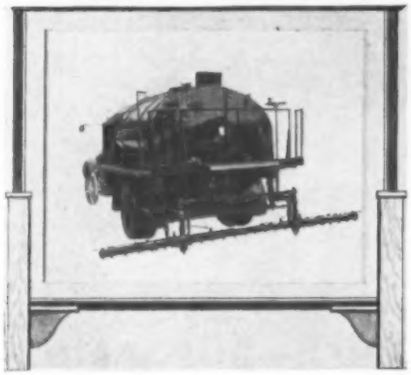
**The SISALKRAFT Co., 205 W. Wacker Drive, Chicago, Ill.**

New York, 101 Park Ave. • San Francisco, 55 New Montgomery St.

**SISALKRAFT**

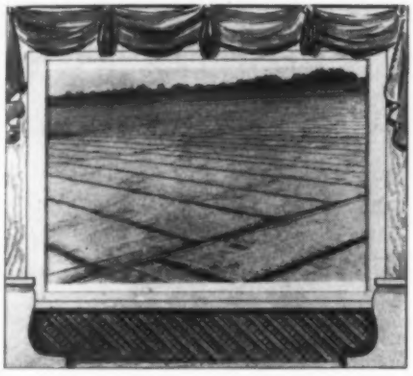
**The Standard Paper for CONCRETE CURING**

## Rosco Manufacturing Co.



Rosco distributor with 4 section folding type full circulating spraybar. Also featured would be asphalt distributors and road oilers, trailer applicators, power spray maintenance units, tar kettles, and torch type burner and heating equipment.

## The Sisalkraft Co.

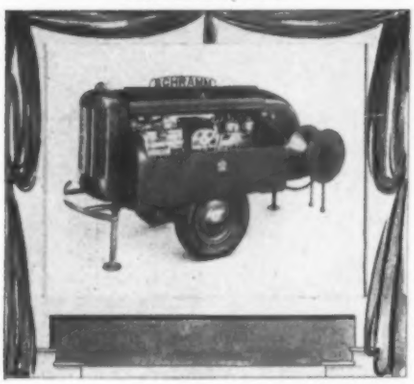


More than 10 acres of Sisalkraft blankets were used for curing and protection of soil cement at the Bull Run Airport, Windsor Locks, Conn. Other photographs and samples of Sisalkraft blankets would be shown.

## Sterling Machinery Corp.

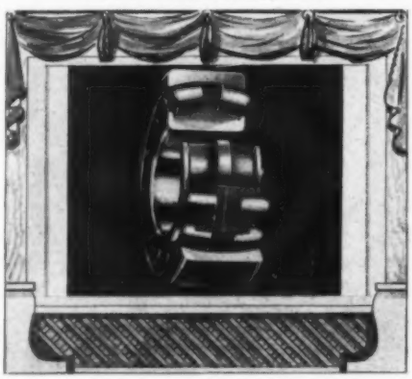
Shown above are: Sterling double drum hoist, hand diaphragm pump, 2" to 4" Sterling selfpriming centrifugal pumps, Sterling electric generating plants, and Sterling sawmaster.

## Schramm, Inc.



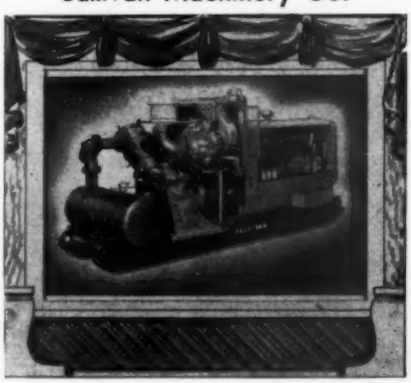
105 gasoline engine driven 2 wheel trailer, deluxe. Other models that might have been shown are: No. 60 two wheel trailer, deluxe; 210 gasoline engine 2 wheel trailer and 210 four wheel trailer, deluxe; and 315 diesel engine on 4 wheel pneumatic tires.

## S K F Industries, Inc.



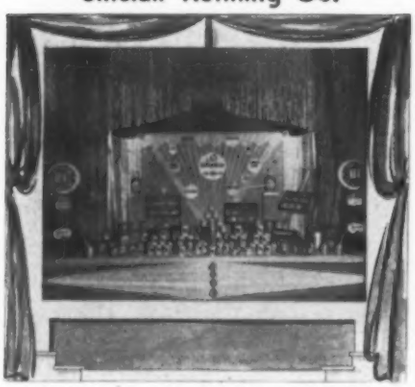
S K F spherical roller bearing, used on bulldozers, scrapers, crushers, conveyors, and other types of road machinery.

## Sullivan Machinery Co.



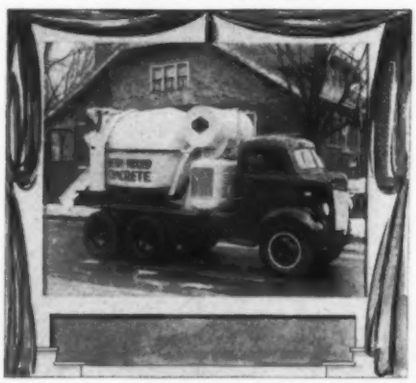
Sullivan semi-portable compressor. In addition, the wagon drill, the new Zephair, and a complete line of rock drills, paving breakers, steel, bits, contractors hoists and other contractors equipment would be displayed.

## Sinclair Refining Co.



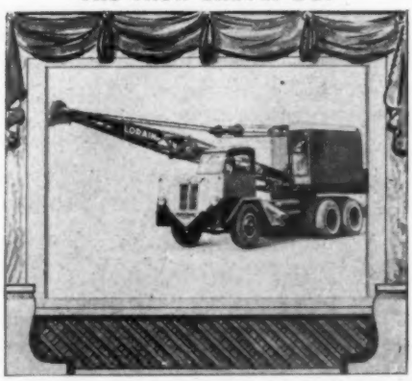
A complete line of lubricants for all types of automotive road building and contractor construction equipment.

## The T. L. Smith Co.



New 3½ Smith-Mobile high discharge truck mixer, mounted on a Ford cab-over-engine type truck, equipped with Thornton drive. Visible mixing is one of the features of the truck.

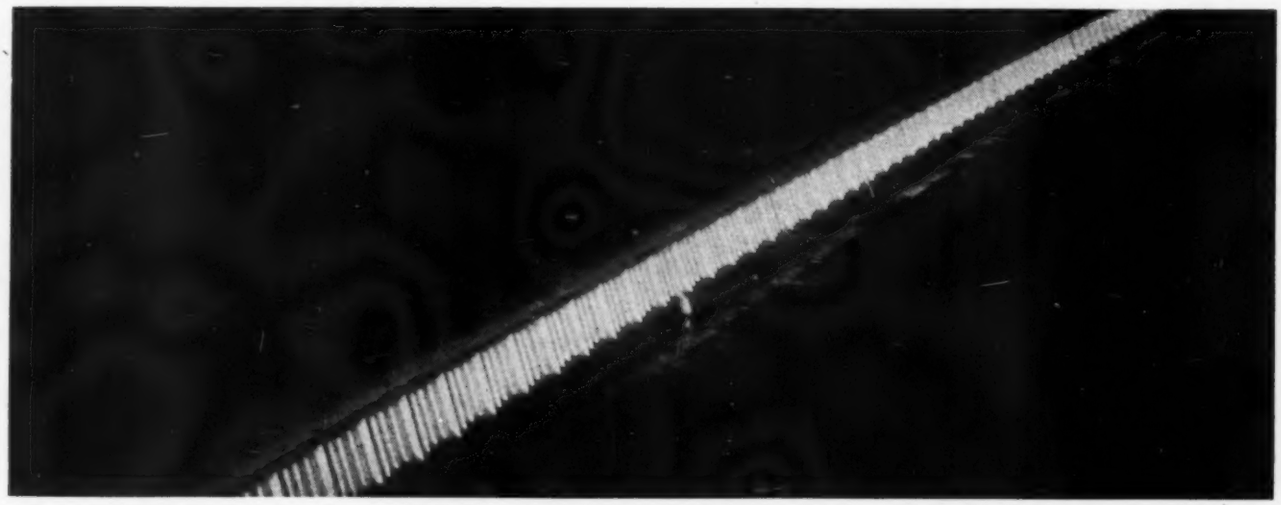
## The Thew Shovel Co.



Universal-Lorain moto-crane which is convertible for use as a crane, shovel, clamshell, dragline, or backdigger. In addition, ⅜ to 2 yard Thew-Lorain crawler shovels, cranes, clamshells, draglines, and backdiggers might be shown.

# THEY TURNED CONCRETE INTO MIRRORS

## *that make night driving* SAFER!



WHY IS the visibility of smooth concrete curb practically nil under car headlights? And why does White Concrete Reflecting Curb, even on rainy nights, as in this picture, provide a gleaming guide to safety?

The answer lies in the reflecting faces of the white concrete curb that act like mirrors. These "concrete mirrors," lying perpendicular—not horizontal—to the headlight rays, reflect the light back to the driver, thus enabling him to *see* the gleaming curb. Hence, visibility is high. Smooth white concrete curb does not reflect headlight rays back to the driver. It throws practically all headlight rays forward—away from the driver; hence, visibility of smooth concrete curb is low.

Today engineers in many states and cities are increasing night driving visibility with these "mirrors of concrete." Reflecting curb made with Atlas White Cement is scientifically designed. Its saw-tooth faces or "mirrors" direct the headlight rays back to the driver. Effective in the daytime, highly efficient on dry nights, and most efficient on rainy nights, White Concrete Reflecting Curb has proved an important contribution to highway safety.

**A NEW BOOKLET TELLS THE COMPLETE STORY OF THIS NEW SAFETY CURB.** It gives you the *Why, What* and *How* of White Concrete Reflecting Curb. Thirty-two pages, complete with photographs of actual installations, diagrams of the principles of reflection, working drawings, and specifications for practical application, tell the story of this new safety curb. Send today for **A WHITE GUIDE TO SAFETY.** Write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Dept. 50, Chrysler Bldg., New York, N. Y.

• • •

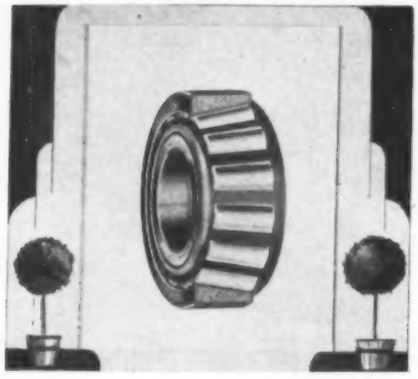
**OFFICES:** *New York, Chicago, Phila., Boston, Albany, Pittsburgh, Cleveland, Minneapolis, Duluth, St. Louis, Kansas City, Des Moines, Birmingham, Waco.*

RS-M-27

**WHITE CONCRETE REFLECTING CURB**

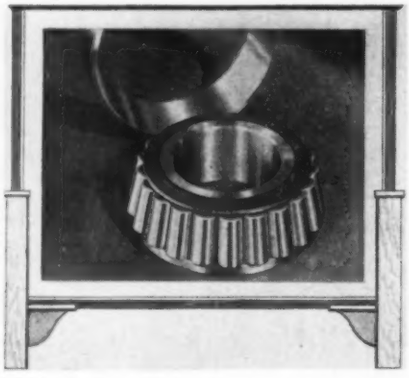
**MADE WITH ATLAS WHITE CEMENT**

## The Timken Roller Bearing Co.



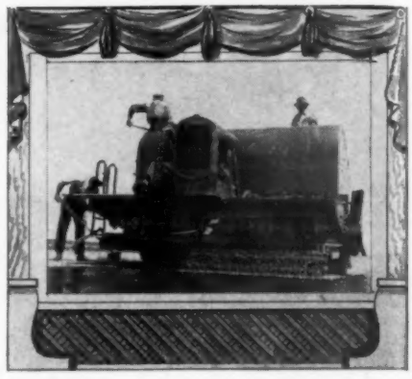
Timken tapered roller bearings used in construction machinery of all kinds, and Timken rock bits for rock drilling in connection with excavating work

## Tyson Roller Bearing Corp.



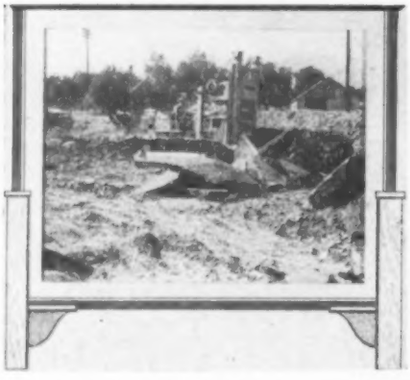
Tyson cageless tapered roller bearings ranging in sizes from 3" to 14" bore, with life curve.

## Universal Crusher Co.



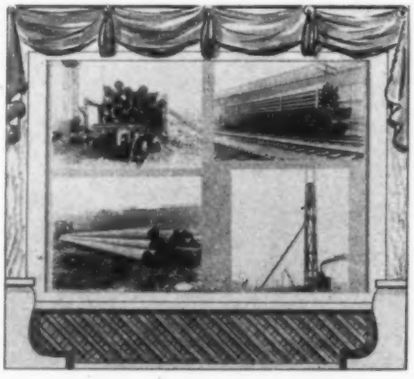
The Universal "Chip Top" spreadroller for applying seal coat to roads, streets and airports. The Universal "Twin Dryer" portable asphalt mixing plant, and Universal streamlined crushers with six roller bearings would also be shown.

## Trackson Co.



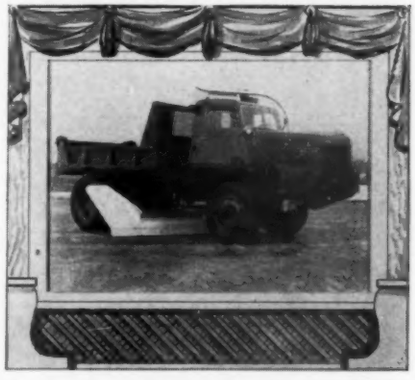
Traxcavator, a heavy-duty tractor excavating and loading machine equipped with a 2½ cubic yard bucket and mounted on a "Caterpillar" tractor. Accessories and attachments for Traxcavators would be shown and other models.

## The Union Metal Mfg. Co.



Pictures of steel Monotube piles showing (1) the piles loaded on cars (2) on the ground ready to be driven (3) placing the pile in position in the leads for driving. Monotubes are made in various sizes, tapers and gauges to meet varying soil conditions.

## Walter Motor Truck Co.



Walter snow-fighter with center scraper blade. Also can be equipped with V-plow and side wings for heavy snow-removal work.

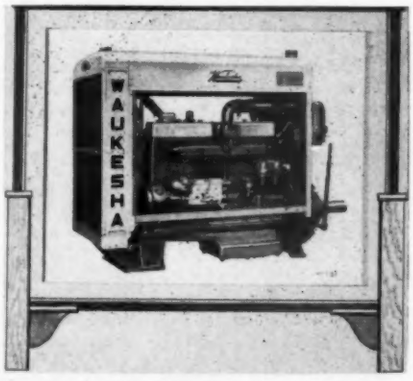
## Truscon Steel Co.

Helping speed production in our nation's armament program. Had there been a Road Show, the Truscon exhibit would have demonstrated the extent to which Truscon steel building products are assisting in the war effort.

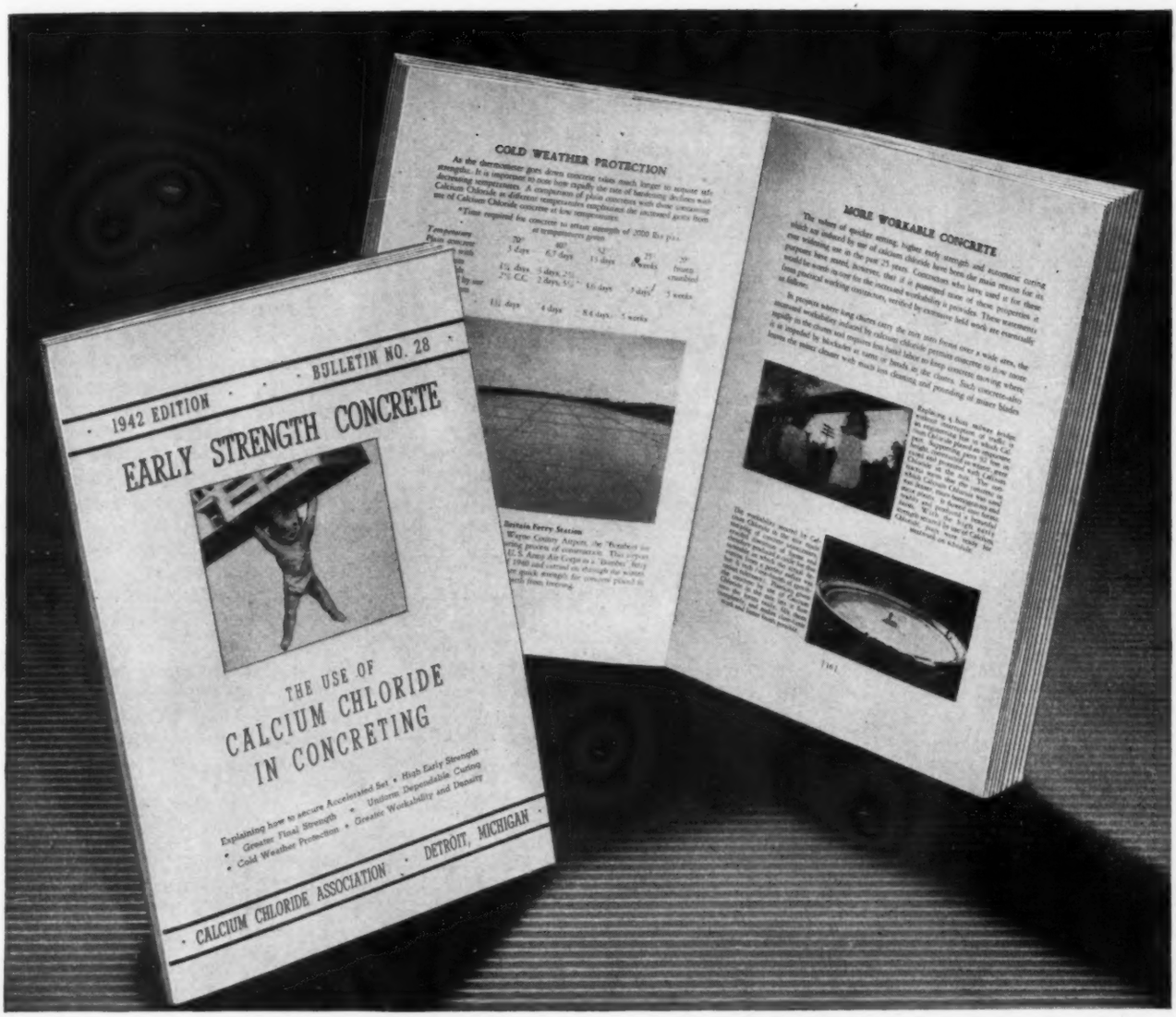
## United States Steel Corp.

Regularly participating in the joint exhibit of United States Steel at the usual Road Show are American Steel & Wire Company, Carnegie-Illinois Steel Corporation, Columbia Steel Company, Scully Steel Products Company, Tennessee Coal, Iron & Railroad Company and Universal Atlas Cement Company, all subsidiaries of United States Steel. Displayed as representative of their products used in the highway industry would be exhibits showing uses of Atlas White Portland Cement, Atlas High-Early Cement, Universal Portland Cement, Atlas Portland Cement, I-Beam-Lok and I-Beam-Lok Open Flooring, USS concrete reinforcing bars, bearing piles, sheet piling, culvert sheets and culvert plates, USS abrasion resisting steel and USS high tensile steels, American Tiger Brand Wire rope, Multi-Safety Highway Guard and USS Wire Fabric.

## Waukesha Motor Co.




Waukesha Motor Company's 170 H.P. Hesselman oil engine power unit. Waukesha's complete exhibit would include engines and power units for use with gasoline, natural gas, and fuel oil, and covering a power range from 5 to 375 H.P.


1942 EDITION
BULLETIN NO. 28
EARLY STRENGTH CONCRETE
THE USE OF
CALCIUM CHLORIDE
IN CONCRETING
Explaining how to secure Accelerated Set • High Early Strength
• Greater Final Strength • Uniform Dependable Curing
• Cold Weather Protection • Greater Workability and Density
CALCIUM CHLORIDE ASSOCIATION • DETROIT, MICHIGAN
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# NEW BOOK ON CONCRETING!

Sixty-four pages of latest data helps you speed up cold weather concrete work. This new concreting manual explains cold weather protection — shows how to secure high early strength and greater workability. It gives latest data from the National Bureau of Standards on the effects of low temperatures and shows how to offset the retarding action of cold weather.

Sixty charts, graphs, photos and tables explain methods in detail. The book contains authoritative research papers and many examples of actual practical concreting operations. It discusses large jobs, small jobs and concrete products. Its many fine chapters will help you in your daily work.

**Every man who works with concrete should have this book. Send coupon today for your free copy.**

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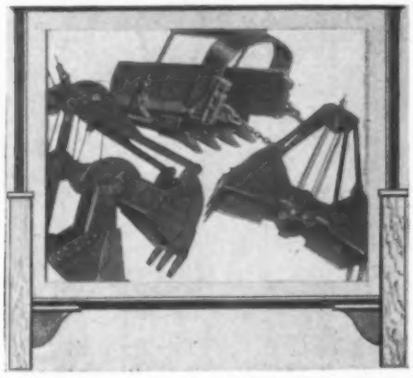
**CALCIUM CHLORIDE**

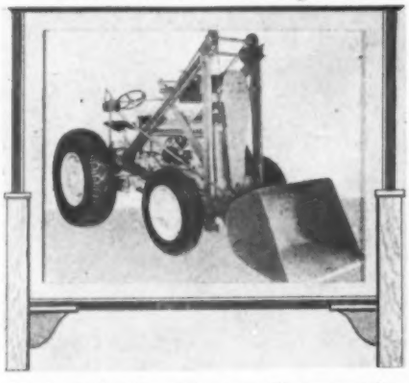
**SPEEDS WINTER CONCRETE CONSTRUCTION**

## Wellman Engineering Co.



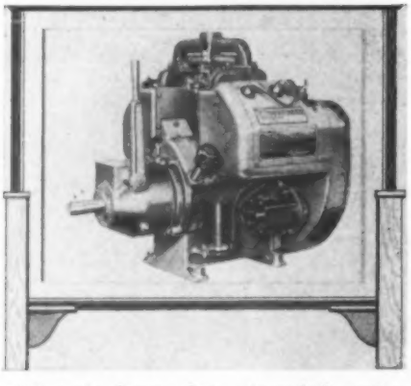
Williams buckets. Clamshell buckets: Power arm and multiple rope types dragline bucket.

## White Manufacturing Co.



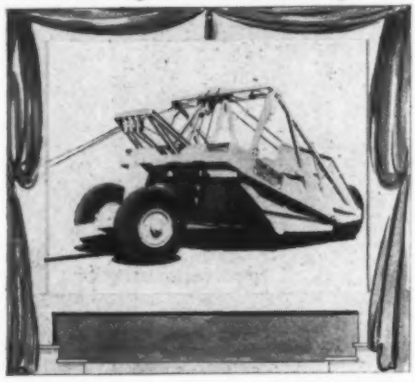
Front end loader with extensible boom. Also shown would have been gasoline engine and electric motor driven concrete vibrators, asphalt heating kettles, kerosene torches, stone dryers and portable asphalt plants.

## Wisconsin Motor Corp.



Wisconsin heavy duty, air-cooled engine, furnished with straight power take-off, clutch, clutch and reduction assembly. Supplied as standard power equipment on graders, asphalt rollers, street sweepers, pumps, air compressors and many other types of equipment.

## Wooldridge Manufacturing Co.



New Wooldridge 3 line scraper, model "BBR" 17¾ cubic yard heaped capacity. Other Wooldridge heavy grading equipment shown would be bulldozers, trailbuilders, road rippers, land levelers, tamping rollers, and power units.

### *Others*

Other sustaining members who failed to send their entries for this Road Show follow:

American Bosch Corp.
The American City Magazine.
The Asphalt Institute.
Bendix-Westinghouse Automotive Air Brake Co.
Better Roads.
Black & Decker Mfg. Co.
Broderick & Bascom Rope Co.
Buda Company.
The Philip Carey Mfg. Co.
Chicago Pneumatic Tool Co.
Chicago Rawhide Mfg. Co.
The Cleveland Trencher Co.
Construction Machinery Co.
Contractors and Engineers Monthly.
Construction Methods.
The F. D. Cummer & Son Co.
Cummins Engine Co.
D. A. Lubricant Co.
The Dow Chemical Co.
Eagle Crusher Co.
Electric Tamper and Equipment Co.
Engineering News-Record.
Fairbanks-Morse & Co.
Firestone Tire & Rubber Co.
Garlock Packing Co.
Goodyear Tire & Rubber Co.
The Gorman-Rupp Co.
Geo. Haiss Mfg. Co.
Insley Mfg. Co.
Independent Pneumatic Tool Co.
Iowa Manufacturing Co.
The Lauson Co.
Lufkin Rule Co.
Master Vibrator Co.
The Ohio Oil Co.
Owen Bucket Co.
The Perfection Steel Body Co.
Public Works Magazine.
Purolator Products, Inc.
Republic Steel Corp.
Roads and Streets.
Rodgers Hydraulic Inc.
St. Paul Hydraulic Hoist Co.
Signal Service Corp.
Smith Engineering Works.
Spicer Manufacturing Co.
Topeka Hiway Mower Co.
Twin Disc Clutch Co.
Universal Unit Power Shovel Corp.
Vulcan Iron Works.
The S K Wellman Co.
Worthington Pump & Machinery Co.

## Big City Traffic Is Largely Local

Traffic within the larger centers of population in Minnesota is predominantly of local origin, according to figures released by the Minnesota Highway Planning Survey. The proportion of local traffic decreases with the size of the community, it was found from an analysis of road use data obtained from interviews with nearly 20,000 motor vehicle owners representing all occupational groups in all sections of the state.

Travel on all roads and streets within the city limits of Minneapolis and St. Paul was found to be 93.6 per cent by vehicles owned in the Twin Cities, 3.5 per cent by vehicles from other urban areas, and 2.9 per cent of rural origin.

Travel within the city limits of Duluth was 66.1 per cent by Duluth-owned vehicles, 2.7 per cent from the Twin Cities, 7.6 per cent from other urban areas, and 23.6 per cent of rural origin.

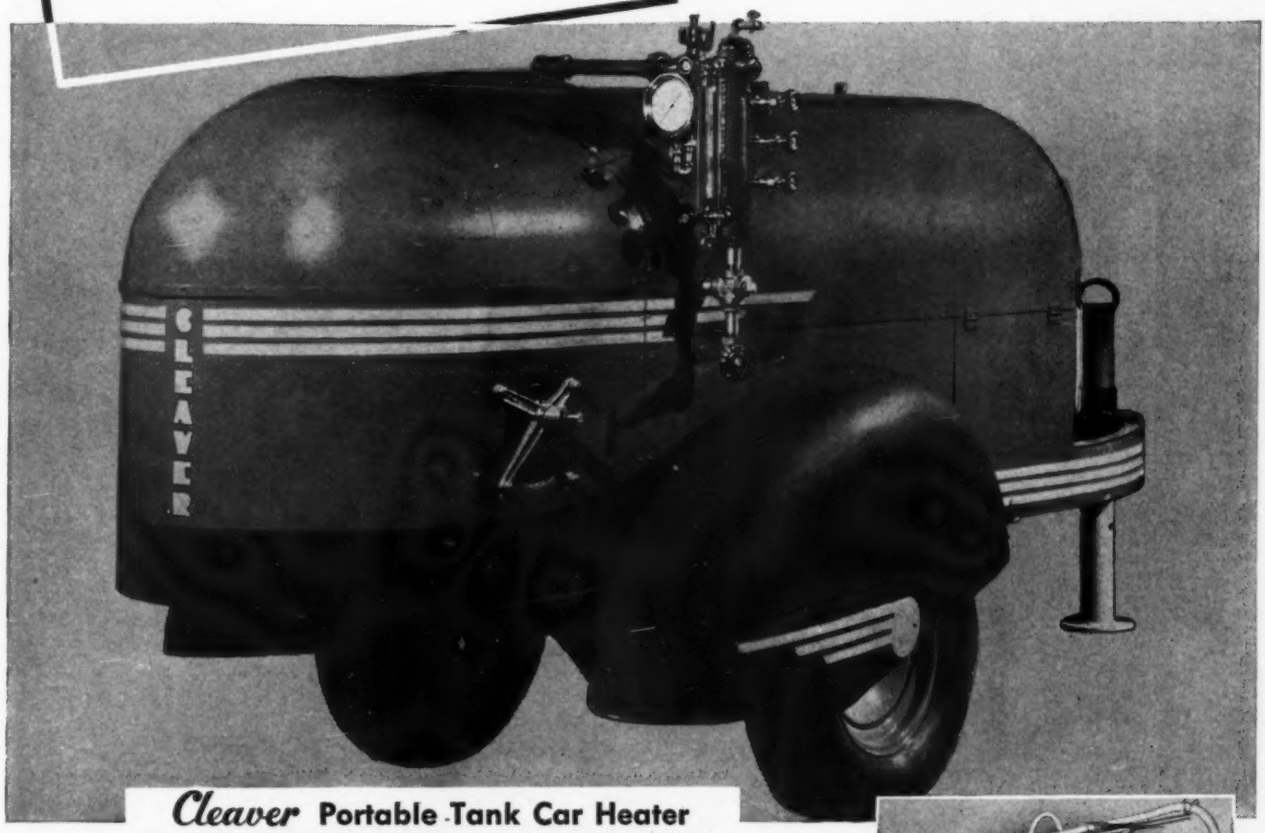
Travel within municipalities of 10,001 to 25,000 population was 68.9 per cent by vehicles owned in these places, 5.2 per cent from the three large cities, 6.6 per cent from other urban areas, and 19.3 per cent of rural origin.

Travel within municipalities of 1,001 to 2,500 population was 37.3 per cent by vehicles owned in these places, 20.9 per cent from the three large cities, 13.9 per cent from other urban areas, and 27.9 per cent of rural origin.

Travel on all roads and streets in rural areas was 54.8 per cent of rural origin, 17.5 per cent from the three large cities, and 27.7 per cent from other urban areas. On trunk highways in rural areas travel was 42.7 per cent of rural and 57.3 per cent of urban origin. On county (state aid and county aid) roads travel was 86.7 per cent of rural and 13.3 per cent of urban origin. On rural local roads and streets travel was 87 per cent of rural and 13 per cent of urban origin. "Rural areas" include all unincorporated areas and all incorporated places of 1,000 or less.

# Cleaver

## ...THE BEST KNOWN NAME IN HEATING EQUIPMENT FOR BITUMINOUS MATERIAL IN TANK CARS AND STORAGE TANKS




### *Cleaver* Portable Tank Car Heater

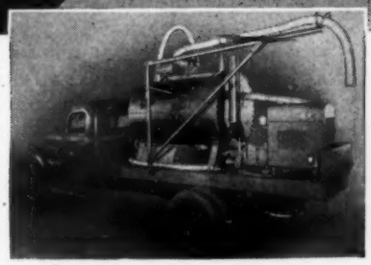
The Cleaver Portable Tank Car Heater — a high pressure, oil-fired, compact and mobile heater available in two and three tank car sizes. Famous Cleaver design boiler with four-pass flue travel assures most economical operating costs. Turbine type condensate return system operates without loss of water from car coils.

Tank car heaters and bituminous boosters were pioneered by Cleaver — hundreds of them are in nation-wide use today. Their superior performance is achieved through the original, exclusive Cleaver four-pass, down-draft flue travel and integral burner construction.

*Our "Victory" effort comes first! Greatly enlarged Cleaver-Brooks manufacturing facilities are going "around the clock" for military production.*

When you need to heat — circulate — pump all grades and kinds of bituminous materials in tank cars or storage, there is a Cleaver Tank Car Heater or Pumping Booster to do the job faster, with substantial savings of fuel, time and money. Write for complete information.

**CLEAVER-BROOKS CO., 5101 N. 33rd St., Milwaukee, Wis.**



### *Cleaver* Portable Pumping Booster

Cleaver Portable Pumping Booster — withdraws pumpable bituminous material from car — heating by direct firing to application temperature in one operation. Raises car temperature 50 degrees per hour. Available in three sizes — on truck mounting or 4-wheel trailer.

**Pioneer Builders of Heating Equipment for Bituminous Materials in Tank Cars and Storage Tanks . . . Cleaver Heaters and Boosters . . . Aggregate Heaters and Dryers . . . Cleaver Automatic Steam Plants**

# EDITORIAL

## What of the Immediate Future?

STATE highway departments are finding it difficult to set up budgets for 1942 due to priority regulations and programming regulations of the Public Roads Administration. Rules established require that any projects on which Federal-aid funds are to be employed must show definite defense necessity. Other projects on which no Federal-aid funds are to be used must be supported by evidence indicating that the project is mandatory for the health and safety of the public if such project is to receive a priority rating. The need for the priority rating is to enable the "department" or the contractor to obtain materials which are included in the "critical list." The contractor needs the priority rating to obtain any new equipment which he may require for prosecuting the job. At the present time no one has ventured a definition of "public health and safety" as applied to road or street projects.

Consequently, rural district, township, county, municipal and state road administrative bodies are practically at a construction stand-still. Figuratively speaking, they are sitting around waiting to see what they can do. This condition leads to a feeling in some quarters that the man-power of the organization must be reduced. Herein lies the big danger to the continued employment of men. As now being enforced, the rules will shortly become the driving force requiring wholesale dismissal of engineers and the consequent disruption of contractors' organizations.

Until definitions are forthcoming regarding "public health and safety" as related to road and street work, it behooves the administrative officers of road and street work to employ their forces on maintenance and the planning of "post war" projects.

Another thing which is causing concern regarding budgeting and programming of highway work is the loss of traffic revenues caused by tire and new car rationing. In some places traffic on the state roads has fallen off about 15 per cent. In one city it is reported that 30 percent less automobile driving has occurred. These figures are only estimates of the moment and may have no significance.

Road and street administrative officers are faced with serious problems in finance and construction. Let us hope that they so arrange their plans as to keep their staffs employed.

▼

## Let State Highway Departments Engineer All Airport Work

AIRPORT design and construction is so closely related to highway engineering that it is but a short step from one design and construction procedure to the other. State highway departments are efficiently and effectively staffed for engineering work. It therefore occurs to the writer that all airport design and construction work within a state including military and naval airports, should be handled by the state highway departments during this period of national emergency.

Why not? Military, naval, or civil aeronautic advisors may be needed to check and verify plans, but all of the routine engineering could very effectively be handled by the state highway department organizations.

▼

## Intercommunication Prime Importance

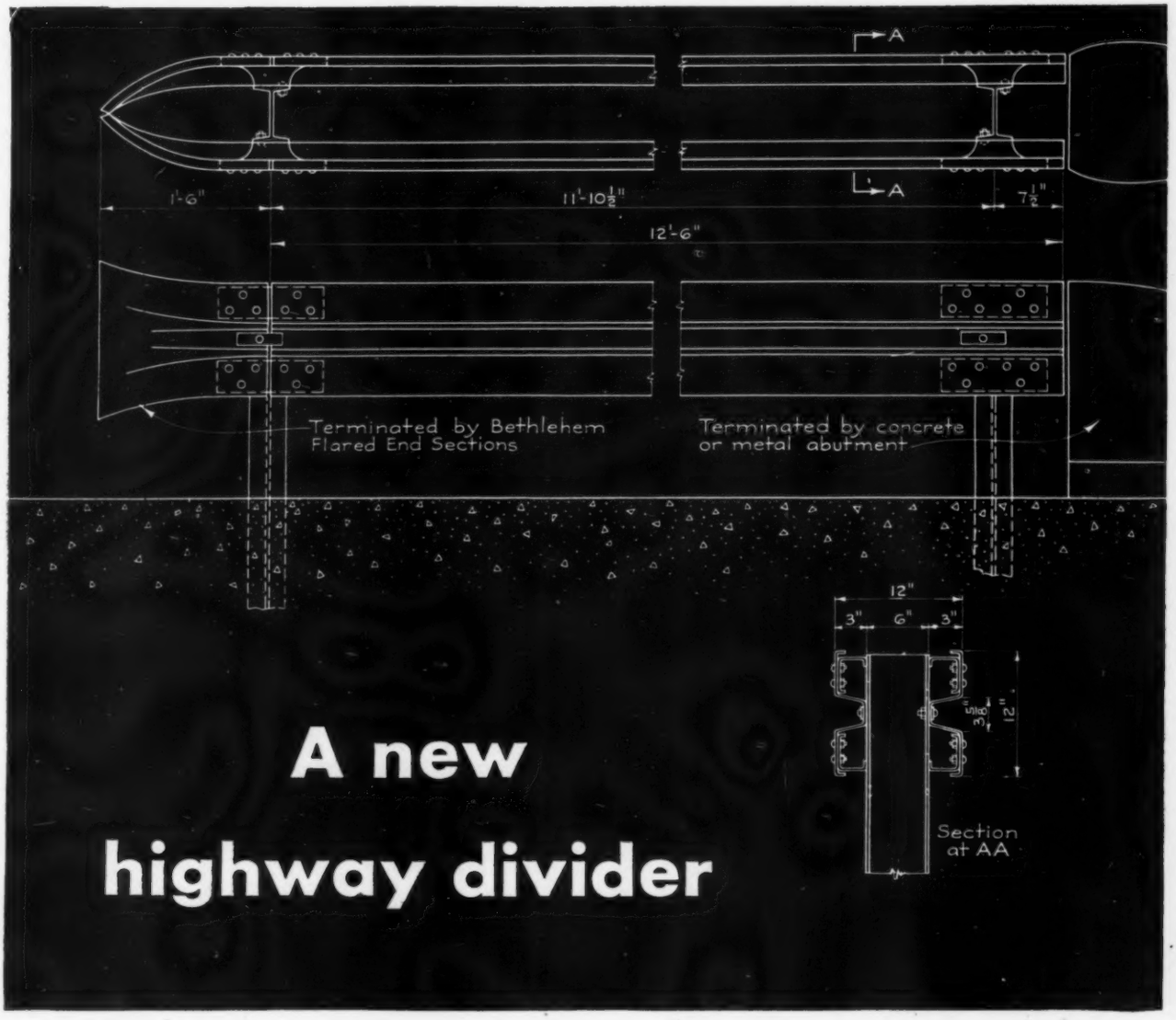
RECENTLY the director of highways of one of the South American countries completed a tour of inspection of low cost road work in the United States, principally west of the Mississippi River. He also visited several equipment manufacturing plants. The writer spent a short time with him, during which we got snowbound on New Year's Day in Iowa.

This engineer was very well pleased with the friendly receptions he received all along the line. The Public Roads Administration made his trip entirely successful from the highway viewpoint. He realizes the economic differences between his country and the United States but claims they will progress rapidly once they organize to take advantage of their natural resources.

His country, however, is at a permanent disadvantage, one which will require a change in the form of government, before they will be able to compete with other countries in the production of industrial goods they use. One thing, though, which this investigator learned was that first, they must build roads to tap their agricultural and mineral areas. He returned to his home firmly convinced that new roads on a large scale must be built. Intercommunication between the coast and the interior, between various sections of his country, he found to be of prime importance in its development.

Trips like these are extremely important in the welding of good neighborliness, understanding, and friendship between peoples widely separated. This investigator said that he noted a big change in the attitude of the American people on this trip (he was here once before—10 years ago). The question which arose in the writer's mind was, Why? The answer, it is believed, lies in the increased facility of the investigator to speak the English language and in the fact that he has added 10 years to his age —a thing in itself which tends toward toleration and understanding.

He had naught but good will and commendatory remarks for those whom he met here on his inspection trip. May affairs so break that many such interchanges can be made between the countries of the Western Hemisphere, for the time is now at hand and the pressure will become greater in the future, when freedom of intercommunication by highway between all the governments of the Western Hemisphere must be easy. Roads must interlace the two continents with services and connections for the Island Republics.




# A new highway divider

# Safety-Beam

Wherever heavy traffic merges on a wide arterial highway, a good highway divider can often protect lives and property.

Such a divider must be easy to see. It must be strong enough to cradle runaway cars and redirect them with a minimum of shock. Finally the divider must be economical to buy and install.

Bethlehem Safety-Beam Guard Rail fills all of these requirements. It is rolled of heavy steel plate in standard 12-ft. 6-in. lengths (or longer if desired). The wide channel construction offers both high strength and quick positive visibility.

The divider assembly is complete as illustrated above. Bethlehem steel posts are used. Ends may be terminated by standard guard rail end pieces or with metal or concrete abutments as desired. This divider assembly is economical to purchase, and easy to install.

Write to Bethlehem Steel Company for complete details on this new highway divider assembly. Your inquiry will receive prompt attention.

BETHLEHEM STEEL

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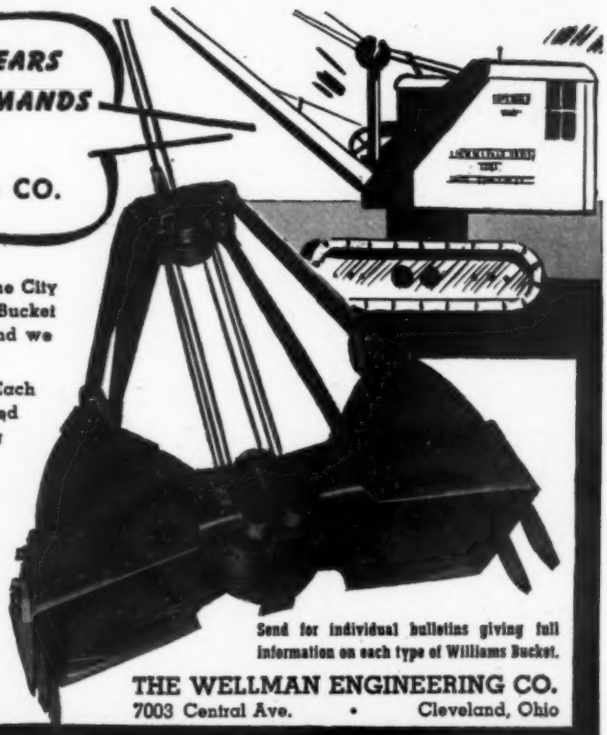
"WE HAVE USED THIS BUCKET FOR 2½ YEARS AND RECOMMEND IT TO ANYONE WHO DEMANDS STEADY AND MAXIMUM PRODUCTION."

THE CITY EXCAVATING CO.



"We have long since realized," writes A. J. Carlozzi, president of The City Excavating Co., Cleveland, Ohio, "that your 1/2 yard Multiple Rope Bucket gives us far better service than any other make previously used, and we have used several other makes of buckets."

Williams Buckets are truly "built to last and move dirt fast". Each type we build has numerous features which have been developed by over 35 years of bucket engineering for contractors, dredging companies and steel mills. Always a leader in welded design, Williams Buckets now feature welded construction at vital points, using rivets only at certain sections where ultimate replacement may be required. Make your next bucket a Williams!

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# Reviews of Books and Booklets

***Reviewed by* V. J. BROWN**
Publishing Director

## Surveying

Surveying, by Charles B. Breed, Professor of Civil Engineering, Massachusetts Institute of Technology, is the title of new book just published by John Wiley & Sons, Inc., New York. The book, of 495 pages, has semiflexible binding and is pocket size. It is priced at $3.00 per copy.

This text has been prepared to meet a shorter time allowed for surveying in the college curricula as newer engineering subjects are introduced. Many of the shorter courses in surveying are so limited for time, that emphasis must be placed on principles and on the use of surveying instruments.

The usual field and office practices in land surveys, in leveling, and in topographical survey are thoroughly covered. The chapter on Lines and Grades gives an insight into the surveying problems that arise in connection with engineering construction. The book is built around a problem of a single land survey which is carried along from chapter to chapter. There is a chapter on Public Lands Surveys even though this branch of surveying is not much employed.

## American Highway Practice Volume I

American Highway Practice, by Laurence Ilsley Hewes, B.Sc., Ph.D., Chief, Western Region, U. S. Public Roads Administration, and Member American Society of Civil Engineers, is a comprehensive treatment of present rural highway survey, design, and construction practice in the United States. Published by John Wiley and Sons, Inc., New York, it is priced at $5.00 per copy.

In the chapter on Highway Location the following excellent statement or criterion of location is given: "The best located two-lane highways should operate at constant average speed, even at their free-moving capacity, and without gear-shifting in ascent or braking on descent." This chapter is excellent and shows the intimate knowledge of the author with problems of location.

An insert between pages 158 and 159 shows how a contractor would plan his grading job. This is the first time the writer has ever seen such a diagram in a book. It is well prepared and indicates how a job can be planned for profitable completion. The way the author treats the subject of grading and fill compaction is very commendable. The information is told simply so that contractors and their employes as well as students can use the book. The author discusses the term "relative compaction" as used in California specifications. This concept of embankment compaction should be universally employed in specifications and leave the contractor free to use his own methods for meeting those specifications.

The influence of West Coast state practices in design and construction practice is quite evident although occasionally reference is made to Eastern state highway department prac-

tice. The book is excellently written and contains what a book on American Highway Practice would be expected to contain. The writer recommends it as a needed volume in an engineer's or contractor's reference shelf.

American practice in design and construction of highways changes more rapidly than one would think. The author avoided some things, probably purposely because of the wide variation of procedures or maybe because of the rapidly changing picture.

## Revised A.I.S.C. Books

The American Institute of Steel Construction announces a revision and a new edition of two of its important and widely used documents:

1. Specification for the Design, Fabrication and Erection of Structural Steel for Buildings. Revised July, 1941.
2. Code of Standard Practice for Steel Structures other than Bridges. Revised August, 1941.

Rather extensive revisions have been included in the new issue of the Specifications embracing such matters as Materials, Loads and Stresses, Unit Stresses, Design, Fabrication, Erection and Inspection. The Code has been revised only in that part relating to weights of standard fillet welds. The Code also contains the standard contract forms used by the members of the industry.

Copies of either document may be had for ten cents (10c) each by addressing the American Institute of Steel Construction, 101 Park Avenue, New York, N. Y.

## State Files Claim for Road Damage

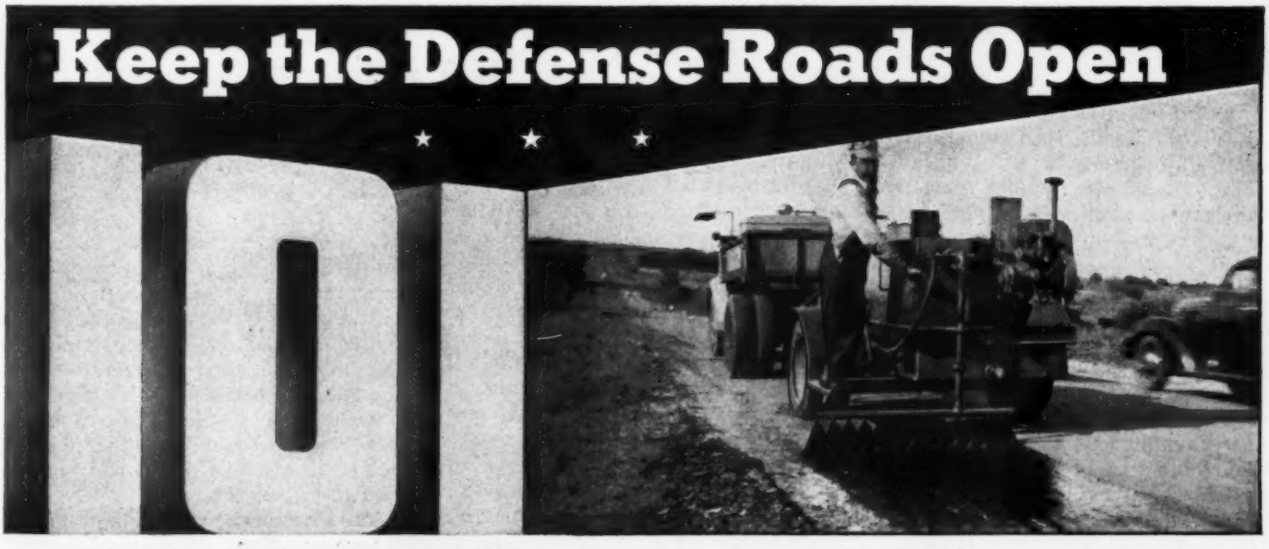
The Louisiana State Highway Department has filed a claim for $2,-013, 689.30 with the United States Public Road administration for damage done to state highways during military maneuvers this past summer and fall. Field men with automatic recording instruments reported that traffic in the area during the maneuver period rose from a daily average of 40,762 vehicles, to 95,023 vehicles daily—an increase of 133% above the traffic volume recorded at the same points during 1940.

## Linn Enslow Elected Chairman Sanitary Engineering Division Am. Soc. C. E.

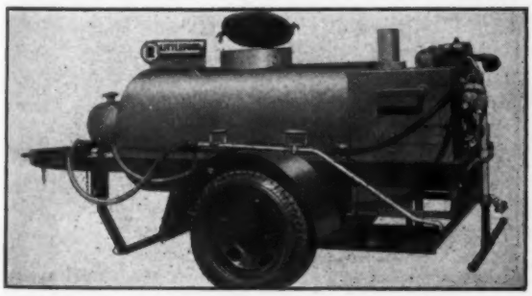
At the recent annual meeting in New York City of the American Society of Civil Engineers Linn Enslow, M. Am. Soc. C. E., vice-president of the Gillette Publishing Company and editor of *Water Works & Sewerage*, a Gillette publication, was elected chairman of the Sanitary Engineering Division of the Society. This means that he is also chairman of the Executive Committee and responsible for programs and all committee work. Mr. Enslow has been a member of the Executive Board for five years, and for two years has been chairman of the Awards Committee.

L. H. Enslow

*Weed Control in California.*—State Highway Department of California spent $102,000 in 1939 to control weeds along the highways.


UTILITY SPRAY TANK



When constructing Airport Runways, Access Roads, Defense Plant Roadways, etc., be sure there's a Littleford Model No. 101 Utility Spray Tank on hand. It will speed up the work because it has the facilities for doing three jobs. Has Spray Bar, Hand Spray, and Pouring Pot outlet. Let's keep our Roadways and Runways open by using Littleford Construction Equipment.

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BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE 1900

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# About Contractors and Their Jobs

## Michigan Area

REPORTED BY

**J. M. TELFORD**

Charles M. Upham, Engineer-Director of the American Road Builders' Association, and G. Donald Kennedy, Michigan's State Highway Commissioner, will be among the featured speakers at the 28th annual Michigan Highway Conference, to be held at the University of Michigan, Ann Arbor, Feb. 18-20. Relation of highways to war and post-war conditions, recent developments in methods of construction and maintenance of highways, and traffic engineering and highway safety will be subjects to be discussed during the conference. Malcolm Bingay, columnist of the Detroit Free Press, will be the principal speaker at the conference banquet. The annual meeting of the Michigan Association of Road Commissioners and Engineers will be held during the conference.

John H. Barr, for the past 16 years with the Oakland County Road Commission, was appointed County Road Engineer by the Livingston County Road Commission. He succeeds the late William J. Slavin.

Bids were received by the State Highway Department Feb. 4 on additional construction in connection with access highway to the Ford Bomber plant near Ypsilanti and to Fort Custer. Work involved in the letting includes considerable road building and two- and three-level grade separations to facilitate employe traffic at the bomber plant, which already is employing thousands of workers.

The Strom Construction Co. has a $55,420 contract for construction of barracks and buildings at Camp Skeels.

Closing of 22 gaps, aggregating some 32 miles, on its hard-surfaced system of roads is proposed in the 1942 budget of the Saginaw County Road Commission. About 34 miles of bituminous retread surfacing was laid by the commission last year.

Apportionment of a total of $4,210,749 in federal funds for Michigan highways has been announced in Washington. Of this amount, $3,028,945 is for regular federal aid, $530,065 is for secondary federal aid, and $651,739 is for elimination of grade crossings. In addition to federal funds from these sources, the State Highway Department is reported to be in an unusually good position with regard to available state funds, so it is expected that the construction program for the year will compare favorably with previous programs.

## Kansas City Area

REPORTED BY

**PAUL L. MATCHETTE**

E. C. L. Wagner, manager of the Missouri A. G. C. at Jefferson City, Mo., is making up a special inventory of all road contractors equipment in Missouri for defense purposes. On Dec. 29, 1941, Mr. Wagner wrote to 495 contractors in Missouri to obtain a list of their equipment that would be available so that this inventory could be kept on file and subject to immediate call if wanted. This inventory of equipment is to be kept confidential by the A. G. C. and is to be used only when requested by the Missouri State Council of Defense. The inventory is to be used to locate equipment which may be needed without any delay in order to repair damage to public utilities and other public works which may have been damaged by acts of war or sabotage. Mr. Wagner is working very closely with Mr. Hugh Stephens, vice-chairman of the Missouri State Council of Defense.

In early January the Kansas Road Contractors ended another successful annual meeting at the Hotel President in Kansas City, Mo. A highlight of the meeting was the talk given by Mr. M. W. Watson of Topeka, president of the National A. G. C. M. W. was chief engineer of the Kansas State Highway Commission in the early '20's, and knows the construction field from all angles. Bill Schlicter of Clay Center was there renewing acquaintances with old friends. Bill just weathered a serious sick spell but is looking fine. Bill Shears of J. H. Shears Sons at Hutchinson is out again after spending a long time in the hospital due to a broken hip received in an automobile accident. All of the boys were glad to see him at the meeting. Bill was elected the new president.

Clare Miller, managing director of San Ore Construction Company at McPherson, Kansas, attended the first part of the meeting, but he had to leave for Roswell, New Mexico, to figure on the Roswell Airport job. Chet Rutherford did himself proud on the entertainment committee. All agreed that this year's entertainment was one of the best. Curt McCoy, Harry Taylor, George Bennett, Ray Tripp, and Bill Ballard all did a real job on the committee. All the boys appreciated the efforts.

Charlie Clark, Red Burt, and Ed Maxwell were on the job and kept everything moving. Ray Blodgett and Joe O'Neil, Al Tucker and Tom Stamey did a fine job of keeping everything in order, at least, during the early part of the meeting! After that—well, who could expect a sergeant-at-arms to work overtime. He got nothing for overtime, and then it was a contractors' convention.

Ross Keeling, the popular chief of the Kansas State Highway Commission, was there with all of the department and division heads. George Van Kepple, Vic Phillips, Walter Bublitz, Art Luder, and all the other popular machinery men attended.

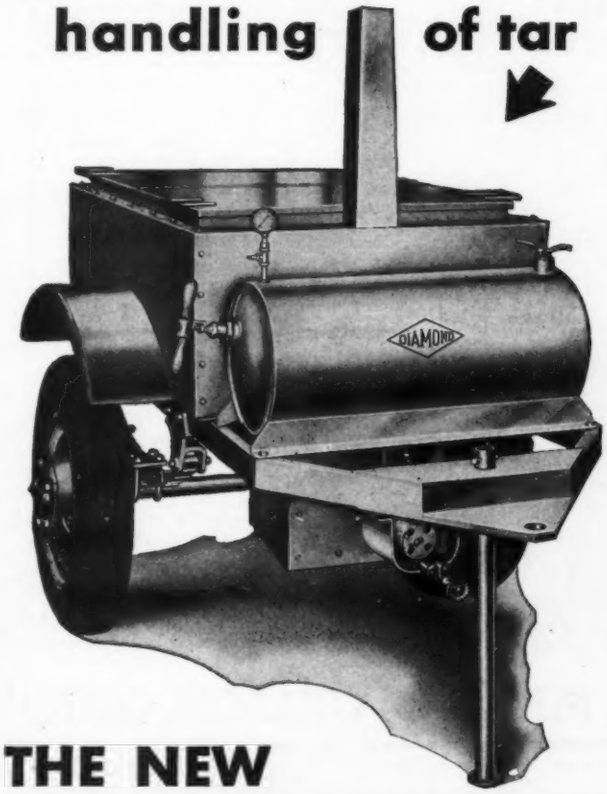
Brownie of Sheffield Steel, Johnny Boyd of K. C. Structural, Bert Waters of Carter-Waters, and all the material boys were on the job helping to spread the New Year cheer, priorities and good tidings that did much to co-ordinate the opportunities and work to be accomplished by contractors in the months ahead.

The meeting was a big success and, confidentially, one of the main reasons was because of the efforts of Miss Martina Hyatt and her boss Bill Ballard of the Kansas Contractors' Association.

The road issue in Kansas is a problem where some routings are contrary to local interests due to Federal direction on account of the defense situation. The new merit system for state employees may end the patronage troubles for Kansas governors and their administration, but they still have the problem of allotting State Highway funds. Kansas' basic road problem is that the State has one dollar to spend for every ten dollars of needed projects. Kansas Highway mileage is the second largest in the nation. Its revenue is the second lowest. The Federal Bureau of Roads is now placing special emphasis on the straightening, widening, and general improvement of the principal through routes. Everything is being done by the State officials to cooperate with the federal officials. Up to date a definite program has not as yet been worked out. However, all indications point to an active road construction year in Kansas for 1942.

The combination Road and Farm Equipment Show held annually the last week in February at Wichita, Kans., has been postponed indefinitely according to Fred G. Wieland, general manager. He said that action was taken by the directors who authorized the following announcement: "Due to conditions that have arisen from the Defense Program and Declaration of War, the 15th Annual Southwest Road Show and School, and the 39th Annual Western Tractor and Power Farm Equipment Show, scheduled for February 24 to 27, 1942,

# For the most efficient, low-cost heating and handling of tar

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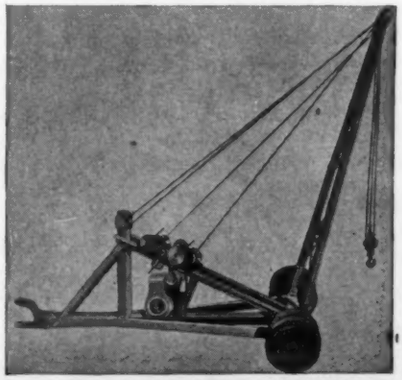
For new highway and street construction, or for maintenance work, this modern, highly efficient tar and asphalt kettle meets a definite need.

Double circulated heat is furnished by a MAHR torch unit to a large combustion chamber which affords greatest fuel economy. But a few minutes are needed to light burner and have tar or asphalt ready for use. Ruggedly built for long service, yet light enough and flexible for quick, easy moving from place to place. Has many features any highway superintendent will appreciate.



**The PORTA CRANE** is the answer to many a daily problem of lifting and moving on the job. Portable. Can be hauled from place to place. Will lift and move, and can even be used as a dragline. Ask for complete details and prices.

**DIAMOND** is making astonishingly prompt deliveries on tar kettles, Porta Cranes, crushers, screens, conveyors, etc. Write for prices and full information.

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### *Build them well for our defense*

Through our roads and streets flows the traffic that is the lifeblood of our wartime defense effort. New and better roads are being built and must continue to be built to link important cities and to provide a means of rapid transportation for our vital defense materials, our troops, our munitions and supplies.

**You may be called upon**

to rush to completion highways not even scheduled as yet. Are you prepared to meet the emergency? Do you need data on location? On design? On specifications? On modern construction methods?

## AMERICAN HIGHWAY PRACTICE

**VOLUME I**

**(Published Jan., 1942)**

**BY LAURENCE I. HEWES**

***Chief, Western Region, United States Public Roads Administration***

covers all these subjects, with no waste words. It starts right in with highway location, and progresses from there to design requirements and principles, grading, landscaping, sand-clay and stabilized roads, macadam roads, gravel and fine-crushed rock roads, and intermediate bituminous surfacings. (The remaining types of road surfacing will be covered in Volume II, due in May.)

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**All out for Victory . . . full speed ahead . . . stay in there and pitch . . . keep 'em moving and flying . . . better streets and highways . . . happier take-offs and landings . . . take a few nips out of Nippon . . . Galion motor graders for new road construction and maintenance.**

| Grader | No. 101 | | No. 201 | |
|---|---|---|---|---|
| Motor H. P. | Gasoline 64 | Diesel 68½ | Gasoline 46 | Diesel 50 |
| Weight* single drive | | | 15,100 | 15,600 |
| double drive | 19,800 | 20,800 | 17,400 | 17,900 |
| Length | 25'2" | 25'2" | 25'2" | 25'2" |
| Blade length | 12' | 12' | 12' | 12' |
| Frame wgt. per ft. lbs. | 92 | 92 | 84 | 84 |
| Reversible blade | Yes | Yes | Yes | Yes |
| Bulletin | No. 253 | | No. 254 | |

*Less scarifier.

**Both models have centralized finger-tip control including steering, leaning front wheels, wide front axle, all-gear driven double drive, full revolving circle, one-piece box-type frame and wide range of attachments. No. 401 motor graders for general maintenance.**

## THE GALION IRON WORKS & MFG. CO., GALION, OHIO


have been postponed indefinitely. A large percentage of the space for showing of machinery had already been contracted for when this announcement was made. The government was cooperating with both the Road and Agricultural exhibits as were the Highway departments of twelve adjoining and surrounding states. No announcement was made regarding the 1943 show. This Southwest Road Show has become very important and entertaining to the Road Contractors, State Highway officials, City and County Road officials, and to the machinery and material men throughout the Southwest territory. It is said that the Road Show draws from 5,000 to 10,000 people interested in road construction, and that the Tractor and Farm Equipment Show held at the same time draws in the neighborhood of around 100,000 to 125,000.

The Kansas State Highway Department has recently instituted a cost finding project to learn the extent of savings possible to be affected for Kansas motorists when driving over paved roads rather than unpaved roads. According to engineers, based on early studies, motorists are said to have once saved up to 2c per vehicle mile when driving on paved roads. It has been estimated that each of the 600,000 car owners in Kansas used pavements an average rate of 6,000 miles annually, or a total of 3,600,000,000 vehicle miles. And on this assumption paved surfaces reduced driving operational costs by perhaps $36,000,000 yearly, or at the rate of 1c per vehicle mile.

State Highway Director D. J. Fair has been praised for the practical plans developed to get at these costs by actually having stock cars driven over thousands of miles of paved and unpaved surfaces. Detailed costs are being recorded for each item which makes up total car operation costs on each road type, such as gasoline, oil, grease, depreciation and proportioning item of liability insurance premiums to mileage obtained on each road type. Even the costs of washing and cleaning cars are being recorded. This is a big item on unbound or unpaved surfaces. Of the greatest strategic importance, now that America is at war and rubber hard to get, is the item of wear on tires. It is said that tire wear on paved surfaces is only half of the cost of that item when operating on unpaved surfaces.

Herby Layman and Vic Gray of Tulsa, Jack Briscoe, Stillwater, Oklahoma, and Stanley Evans of Fort Smith, Arkansas, bid together on the big Roswell, New Mexico, Airport job when bids were opened at Caddoa, Colorado. Their bid was $1,760,000 against the low bid of Nolan Bros., Minneapolis, Minn., of $1,234,000. All told, there were 14 bidders.

### St. Louis Area

REPORTED BY

**O. B. AVERY**

*State Road Programs in Doubt for 1942.*—It is clear from official statements that nothing but the most essential construction projects can be considered in the 1942 road program due to developments in the national defense program necessitating the elimination of non-defense expenditures. The shortage of certain essential materials and the anticipated reduction in revenue due to the rationing of tires and automotive equipment is making it necessary to completely revise the 1942 construction program:

Missouri: Entering 1942 with a maintenance program funded at $6,500,000 and funds available to match any likely federal aid, the Missouri State Highway Department, pursuing its "pay-as-you-go" policy finds its financial position satisfactory, although faced with uncertain revenues due to expected sharp traffic-revenue

curtailments. "All road construction vitually necessary to national defense and suggested by the federal government can be constructed," according to Carl W. Brown, chief engineer. Highway contracts in 1941 totaled $12,589,000, with a mileage of 16,100, an increase over 1940.

Illinois: Public Works Director Walter A. Rosenfeld states that the road program for the State would doubtless be confined to highways defined as military routes and could make no other predictions at this time as the 1942 construction program. The 1941 program of road construction and improvements cost $17,298,000 with an additional $6,132,000 for maintenance and $20,000,000 allotted to counties and municipalities for road and street improvements.

*Missouri State Highway Board Changes.*—Resignation of Robert Brooks of St. Louis as a member of the State Highway Commission cleared the way for Governor Forrest C. Donnell to select at least three members of the four-man commission. H. G. Simpson of Charleston is the only remaining holdover member from the democratic administration.

*Federal Aid for Illinois Roads.*—For highway construction and improvements during 1942, Illinois was promised $5,651,585.00 by the Federal Works Agency. Projects will be restricted to essential defense work. For regular federal aid, $3,947,786.00; secondary or feeder roads, $690,863.00; elimination of railroad crossing hazards, $1,012,936.00.

*Access Road to TNT Plant at Weldon Springs, Mo.*—Plans have been filed for construction of a new access highway around the TNT plant area of Weldon Springs and Federal funds have been appropriated. The highway will start at the junction of U. S. Highway 61 and Boone's Lick road and will run around the plant area to a point near Defiance. It will be 9.674 miles and replace a wide detour.

*Levee Work.*—A surprise recommendation by the President, increasing by $8,000,000 his previous figures, and making his total $30,000,000 recommended for flood control work in the Lower Mississippi Valley area, was contained in a message received by Congress on Jan. 7th. No explanation was given in the message as to why the lower Mississippi Valley figures were raised, while a drop in the general flood control program from $98,780,000 down to $93,685,000 was recommended. Informed comment at Washington was that essential protection of defense industries in the area against flood menace is responsible. The recommendations go to the House Appropriations Committee to be supported by Army engineers' data.

*Airport Construction.*—At Vichy, Missouri, two 5,500 ft. airfield runways, 150 ft. wide; together with two taxiways, each about 400 ft. long and 100 ft. wide; apron 300 ft. by 600 ft.; parking area; and access roads; will start under construction shortly. R. B. Potashnick and Regenhardt Construction Company were low bidder at $823,587.00, with an alternate bid of $736,007.00 on a different type of construction for the same work.

*Army Cantonment Construction.*—Plans are now in progress for the construction of a new army cantonment to house approximately 15,000 men near Lewistown, Illinois. The project is estimated to cost $20,000,000 and construction will be handled under the supervision of Colonel E. C. Hayden, 6th Corp Area, Chicago.

*Dam Construction.*—A combination of firms comprising Massman Construction Company, Hamilton Construction Company, and Metcalf Construction Company, all of Kansas City, Missouri, have been awarded the


RENEWABLE

TRACTOR WHEEL RIMS

Operators the country over are lowering costs and multiplying the life of their Caterpillar Tractor drive sprockets and idler wheels with renewable rims, pictured herewith. Simple instructions for laying out, trimming and welding are furnished with each shipment. Order today — or write for information.

Alloy Steel & Metals Co.

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Manufacturers of PACIFIC CRUSHING & SCREENING UNITS • PACIFIC SLUSHING SCRAPERS & SHEAVE BLOCKS • ALLOY-MANGANESE MILL LINERS & CRUSHER JAWS • PACIFIC ROCK BIT GRINDERS • HAND WINCHES • CRAWLER SHOES, TRACTOR RIMS and other Wearing Parts

Available for most models of CATERPILLAR TRACTORS

Made of wear-resisting MANGANESE STEEL

They're Easily Welded on...Last Longer...Cost Less

first unit at their bid of $19,000,000 of the Center Hill Dam on Caney Fork River, near Carthage, Tennessee. The dam will be about one-half mile long and 200 ft. high of concrete and earth construction.

*Naval Base Extension.*—Dickie Construction Co. of St. Louis have been awarded a cost-plus-fixed fee contract estimated at $4,000,000 for the construction of buildings, facilities and utilities to accommodate 4,000 men at the Naval Air base, Robertson, Missouri, work to start at once.

*Armor Plant.*—Frazier Davis Construction Co. of St. Louis, Missouri, have started work on the construction of an armor plant for the Defense Plant Corporation, near Granite City, Illinois. The General Steel Castings Division of the Commonwealth Steel Company will operate the plant when it is completed. Total cost is estimated at $14,000,000.

*Steel Plant Addition.* — Fruin-Colnon Construction Co. of St. Louis has been awarded a contract for the construction of an addition to the plant of the Scullins Steel Co. at 6700 Manchester Avenue, St. Louis, estimated to cost $2,600,000.

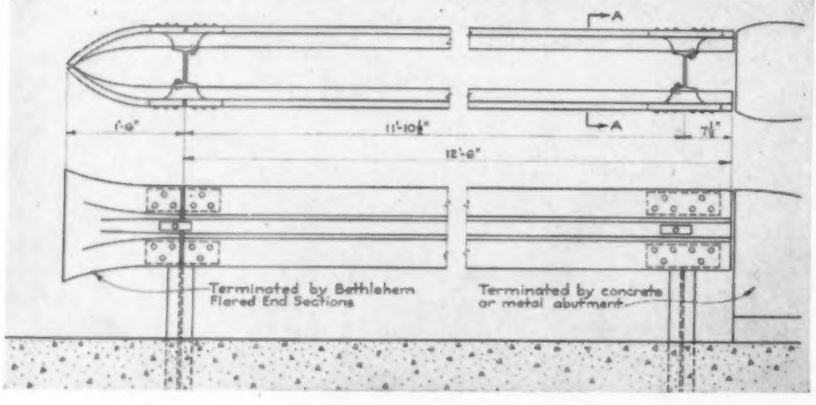
*Contracts Awarded and Low Bidders.*—Dan Christensen Construction Company, Cedar Rapids, Iowa, was awarded contract for the construction of water distribution system at Fort Leonard Wood, Mo., its bid being $45,211.00.

Moore Bros. Construction Co., East St. Louis, Ill., was low bidder at the December 19th letting of the Illinois State Highway Dept. covering road construction on Route 11 in St. Clair County, its bid being $45,992.00.

# New Equipment and Materials

## New Traffic Divider

A new traffic divider made by Bethlehem Steel Co., Bethlehem, Pa., consists of a heavy cold rolled section made of 10 gauge strip steel, 18 in. wide before rolling, 12 in. wide after. It is available in standard 12 ft. 6 in. lengths (or longer if desired). It is stated the wide channel construction offers both high strength and positive visibility. It is easy to install, with any type of post, although steel posts are preferred.



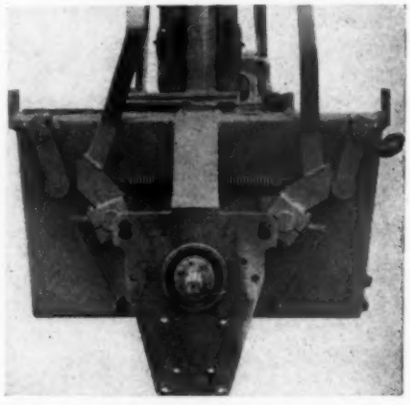

New Traffic Divider

## New Wire Reclaiming Winch

Gar Wood Industries, Inc., Detroit, Mich., is now in production of wire reclaiming winches and reels for reclaiming telephone line wire. The winch will reclaim all sizes of copper and iron telephone wire from poles. It is stated the winch will coil ten miles of wire in one hour and coil this wire suitable for immediate use. The winch is a power driven worm geared unit, having worm gear set of special pitch thread to give proper wire speed. The worm is fitted with automatic brake which allows free movement of the reels in one direction but prevents backward snap action. The winch is entirely controlled from rear of truck by two levers, one for releasing the engine clutch and the other for operating the power take-off. The winch requires one operator and a helper. The chauffeur alone operates the winch; the helper assists in stripping the reels. Whenever small quantities of wire are to be reclaimed, the 5-wire detachable reclaiming reel unit is used. This unit can be slipped on the extended shaft of the standard winch usually on a utility truck.

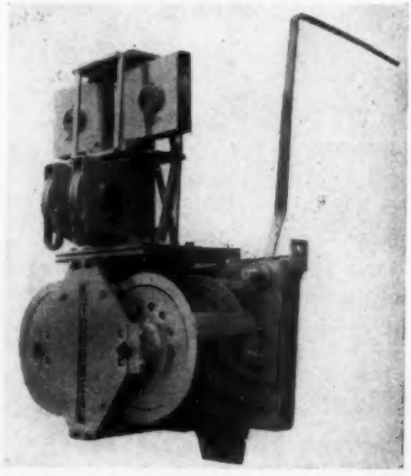
## New Interchangeable Heavy Duty Power Control Unit for Larger Tractors

R. G. LeTourneau, Inc., Peoria, Ill., has brought out the R6-7-8 power control unit. This two-drum unit is designed for interchangeability. The face plate is drilled to allow easy mounting on either D6, D7 or D8



Newly designed face plate is drilled to fit mounting holes on D8, D7 and D6 "Caterpillar" tractors

"Caterpillar" tractors. The same job-proved features that have made the Model R8 power control unit so successful are incorporated in the R6-7-8. Its strong line pull of 5,000 lbs. enables it to handle the largest loads easily. The following advantages are claimed for R6-7-8: stronger, more rugged case; fewer moving parts; larger brakes and clutches; faster heat dissipation through larger exposed area on brake drum; more cable capacity; longer cable life because of larger drum area; stronger line pull.



Power Control Unit

*Wisconsin-powered Asphalt Roller*

WISCONSIN HEAVY DUTY *Air-Cooled* ENGINE AT WORK

Stepping up and maintaining work schedules during these days of high pressure production in all lines, requires equipment of maximum dependability and efficiency.

Because Wisconsin Engines (1 to 35 hp.) are built for *heavy-duty* service; because they are *air-cooled;* because they are compact in design; extremely light in weight; equipped with weather-sealed outside magneto with impulse coupling for quick starting in any weather; because they run on Timken roller bearings . . . Wisconsin Engines AT WORK today, are increasing productive capacity wherever they are in use.

MOST POWER Per POUND

WISCONSIN MOTOR Corporation
MILWAUKEE, WISCONSIN, U. S. A.
*World's Largest Builders of Heavy-Duty Air-Cooled Engines*

# *Dig and Haul* . . . AT LOWEST COST

WHEREVER materials are to be moved any distance beyond the reach of a boom or dipper-stick, a Sauerman machine cuts costs because it is able to dig, haul and place the materials in a continuous straight-line operation.

The equipment investment generally is less, the operating expense always less—when a Sauerman machine is used for these long range jobs.

*Tell us about your problems. We will offer our advice and send our catalog.*

**SAUERMAN BROS., INC.**
**588 S. Clinton St. CHICAGO**

Sauerman Slackline Cableway digs in pit, river, or pond and conveys to bin or spoil-pile.

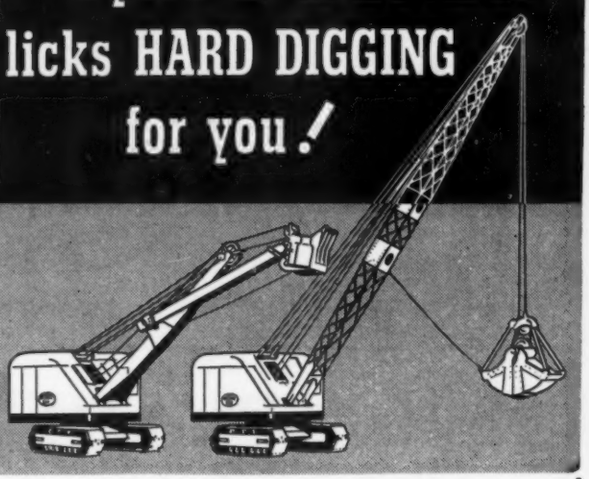
Sauerman Drag Scraper is ideal for pit and bank excavation and general dirt-moving.

Sauerman Drag Scraper is the simplest device for handling bulk materials into and out of stockpiles.

Sauerman Tower Machine is used to dig canals, construct levees, and any work involving an open cut extending a long distance.

SAUERMAN LONG RANGE MACHINES

# Byers POWER licks HARD DIGGING for you!



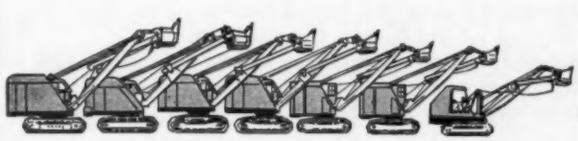
It's power at the business end of a shovel that you need . . . cutting power that brings up a full dipper every time.

In any Byers, "direct drive" delivers MAXIMUM power to hoist, crowd and swing, and to travel in and out where the going's tough.

Ask to see authentic job records, photos, movies of Byers excavators on many varied kinds of work. You'll find someone else with a Byers has already licked a digging job like the one you're going on next.

This is another reason why you should investigate Byers 3/8 to 3/4 yd. shovels.

THE BYERS MACHINE CO., RAVENNA, O.
***Distributors throughout the World***



**11 FULLY CONVERTIBLE MODELS IN 3/8-1/2-5/8-3/4 YD. SIZES**

Modern CRANES and SHOVELS
**BYERS**
RAVENNA, OHIO

IF and WHEN • • TANKS • GUNS • and other HEAVY EQUIPMENTS MOVE • • • ROGERS HEAVY DUTY TRAILERS will be in the very CENTER of ACTIVITY

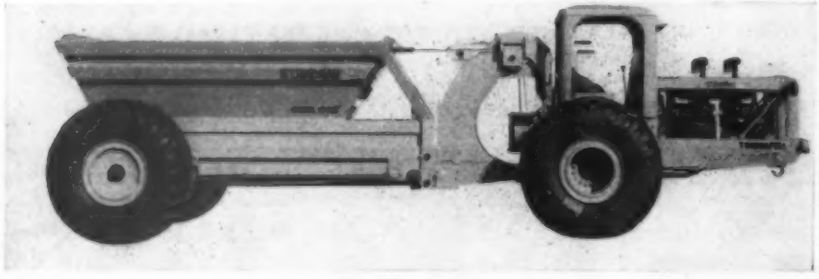
ROGERS BROTHERS CORPORATION 110 ORCHARD ST., ALBION, PENNA.

"FLEX-PLANE"
Finishing Machines
and
Joint Installing Machines
FLEXIBLE ROAD JOINT MACHINE CO.
WARREN, OHIO

Concrete
VIBRATORS and GRINDERS
Write for Circular on types, sizes and Prices
ELKHART White Mfg. Co. INDIANA

### New Hauling Unit

In order to fully utilize the power and speed of the Super C Tournapull, R. G. LeTourneau, Inc., Peoria, Ill., has introduced the W210 Tournatrailer with a heaped capacity of 17 cu. yd. This unit has been designed with flared side and end walls to give the bowl an 8 ft. x 12 ft. 8 in. opening at the top for quick, accurate loading by big dragline or shovel. The W210 Tournatrailer is powered by the 150 h.p. Super C Tournapull for fast pickup and travel, quick spotting and maneuvering. Four forward speeds: 2.6, 4.4, 8.1 and 14.3 m.p.h. and reverse of 2.2 m.p.h. give travel speeds for all job conditions. The Tournatrailer rides on two 21.00 x 24, 20 ply tires—the same size and ply as on the Super C Tournapull. Other features of the W210 Tournatrailer are: patented, self-cleaning, sliding bowl that gives end-dumping or spreading in layers from an inch to 36½ in. in depth; 21 in. external hydraulic brakes, lined with 300 sq. in. of woven braking surface for positive stopping; special analysis steel and box-beam construction for strength with light weight; cable operated from a LeTourneau double-drum power control unit; interchangeable on the same power unit and Super C Tournapull with LP Carryall (15 heaped yards).



W210 Tournatrailer

### New Scoop

The Heil Co., Milwaukee, Wis., and Hillside, N. J., has just placed on the market a new Heil Hi-Speed cable scoop that combines the proven efficiency of the Heil twin-cable scoop with the speed, economy and flexibility of the rubber tired Diesel powered Heil Hi-Speed tractor. Push-loaded with a crawler tractor, this unit is stated to dig a heaped 15 yd. load in 40 to 50 seconds and to speed away to the fill at travel speeds of 6 to 20 MPH, depending on road and grade conditions. The Heil Hi-Speed tractor unit, Model CF600, which furnishes the power for the scoop is a 4-wheel unit equipped with a 150 HP Cummins Diesel engine as standard, although a gasoline engine or other Diesel engines are available. The unit has hydraulic power steer and has oversize brakes on the tractor drive wheel and also on the scoop trailer wheels operated by a foot pedal. Individual hand control brakes on the

New Heil Hi-Speed Cable Scoop

tractor drive wheels give a short turning radius. A 21-in. American Blower fluid coupling drive insures smooth operation and reduces gear shifting time to a minimum. A heavy duty rear axle withstands the shock and strain of operating on rough, bumpy terrain. Dimensions of the Heil Hi-Speed tractor are as follows: 108-in. wheelbase; rear axle, 19 in.; ground clearance (front axle with protector pan), 17 in.; overall length of tractor, 203 in.; width outside rear tires, 103 in.; height, 92 in.; weight with power control unit attached, 17,450 lb. The Heil Hi-Speed scoop has a capacity of 15 cu. yd. and has the same operating features as the 4-wheel Heil twin-cable scoop. Tires on the scoop and tires on the tractor drive wheels are interchangeable. A spring-cushioned push bumper is furnished as standard equipment.

## Two New Cranes

Two cranes, the L20 and L40 have just been released for distribution to the construction and industrial markets by R. G. LeTourneau, Inc., Peoria, Ill. Developed for handling bulky materials for Army use, these cranes give 20,000 lb. lifting capacity

New Le Tourneau Crane

a horizontal distance of 20 ft. 6 in. out from axle center in upright position, thus enable the user to get quick and easy handling of bulky, heavy loads. These cranes, available in 20 and 40-ft. boom lengths, are operated from any size tractor or Tournapull with a LeTourneau double-drum power control unit. They offer large crane lifting power with tractor mobility. The same features that have made the standard LeTourneau tractor crane so successful are built into the L20 and L40. All-welded box-type construction of special steels. Rubber-tires to permit travel over concrete surfaces and give ample flotation for working in soft, mucky conditions. Interchangeable with other LeTourneau equipment on the same power unit. Easily connected or disconnected in a few minutes, thus freeing tractor or Tournapull for other use when lifting jobs are finished. They may be towed behind trucks for transporting from job to job.

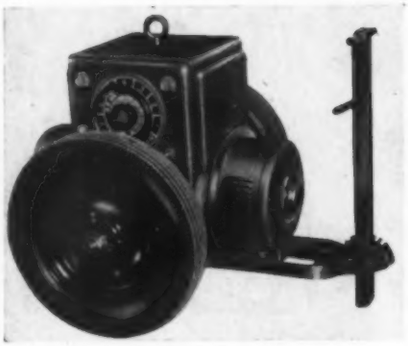
**Today's Outstanding Mowing Combination**

Draw any fair comparison on the six big features you want in a tractor mowing outfit—good work in all conditions, extra strength, ease of handling, stability on slopes, safety, and economy. *On every count* you'll say the John Deere wins. Here is the outfit with every modern advancement including full-view cutter bar with exclusive safety release, power hydraulic vertical lift, curbing attachment, and many others. Bar cuts at 90 degrees up; 45 degrees down. John Deere invites requests for demonstrations. Write for literature and ask for name of nearest distributor.

**JOHN DEERE**
*MOLINE, ILLINOIS*

## New Trailer for Welders

A new two-wheeled, lightweight, pneumatic-tired trailer for mounting 200, 300, 400 ampere Hobart electric drive welders is now in regular production at Hobart Brothers Co., manufacturers of arc welding equipment, Troy, O. It is designed for road towing up to 35 miles per hour. Trailer is so designed that mounting it is accomplished easily by means of three bolts in frame of trailer which register with three holes in the legs of the welding machine. Combination tow bar and standing support has a hand-operated ratchet for locking support arm in position. Unit is easily moved by hand by virtue of its low, underslung construction; narrow tread; and precision method of balancing. This all arc welded steel trailer is capable of trailing over very rough terrain. Measures 54 in. long, 45 in. wide, 27 in. high (over tires); 13 in. axle center. Tires are 16 x 5.50, 4 ply.



New Trailer for Electric Drive Welders


# PEAK PERFORMANCE

ROAD BUILDING WITH A SCHRAMM MODEL No. 315 DIESEL COMPRESSOR AT 5,000 FEET ALTITUDE

## WHEN USING THE MODERN SCHRAMM COMPRESSOR

. . . Operates just as efficiently at HIGH ALTITUDES as at SEA LEVEL. CUT COSTS . . . Own a SCHRAMM . . . Sturdy . . . RUGGED . . . COMPACT CONSTRUCTION without excessive weight . . . SAVES TIME . . . SAVES MONEY.

PERFORMANCE Records in every field are evidence of their high quality and the years of experience behind them.

Built in sizes from 20 to 420 cu. ft. actual air delivered.

Gasoline or Diesel Drive

*Write for Catalog 42-P*

## SCHRAMM, INC.

WEST CHESTER, PA.


## New Concrete Form Tying Device

A new concrete form tying device, called the Richmond Flex-Ty, has been added to the line of the Richmond Screw Anchor Co., Inc., 820 Liberty Ave., Brooklyn, N. Y. The ties are made from very strong cold drawn wires assuring guaranteed strengths. One end of the tie has a preformed helix (wire coil nut) welded to the two strut wires. Richmond Tylags are used in the helix end of the tie while the two wires on the free end of the tie are engaged in the Flex-Ty clamp. The clamp is especially constructed with a hardened wedge shaped bolt the head of which rests against the two wires when the nut is drawn up tight. The ties are made in even half foot or foot lengths beginning at 3 ft. A 3 ft. long Flex-Ty with 2-in. x 6-in. studs and walers, on edge, will fit wall thicknesses up to 19 in. The Flex clamp requires at least 6 in. of the tie wires and when drawn up tight will not slip or stretch thus assuring correct wall sizes.

## New Hydraulically Controlled Boom Bucket

Hydraulic control of its 34-E single and dual drum paver boom buckets has just been announced by the Ransome Concrete Machinery Co., Dunellen, N. J. Ransome's new design permits the bucket doors to be opened or closed to any degree at any position on the boom, permitting the entire drum batch to be discharged into the bucket. Thus any amount of the bucket load may be deposited in any place or places, within boom reach. All inside and outside levers, arms, etc., have been eliminated and the boom bucket carriage has no operating parts requiring adjustment or repairs. The bucket doors slide open instead of dropping which provides a clearance from the ground of 23 in. with the doors open and 21 in. when closed—adequate to clear strike-off devices or other obstructions. Bulletin No. 195 fully illustrates and describes the new bucket. Copies may be obtained by addressing the company.

# WITH THE MANUFACTURERS

## Truck Axle Maintenance Program Announced

W. F. Rockwell, president of the Timken-Detroit Axle Co., has announced plans for an extensive axle maintenance program to extend the life of trucks, trailers and buses during the emergency. The program is the culmination of several years of specialized testing and research work, results of which will be put into the hands of trucking companies, fleet owners and operators, and maintenance men. The program will feature A.M. (Axle Maintenance) and the idea of proper A.M. will be forcefully brought home to truck users in advertising and other literature, and by contacts of Timken field and service representatives. It is planned to show drivers and operators the benefits to be derived from proper A.M. and to stress the importance to victory of eliminating carelessness and abuse of highway equipment.

## A. W. Herrington Elected President Society of Automotive Engineers

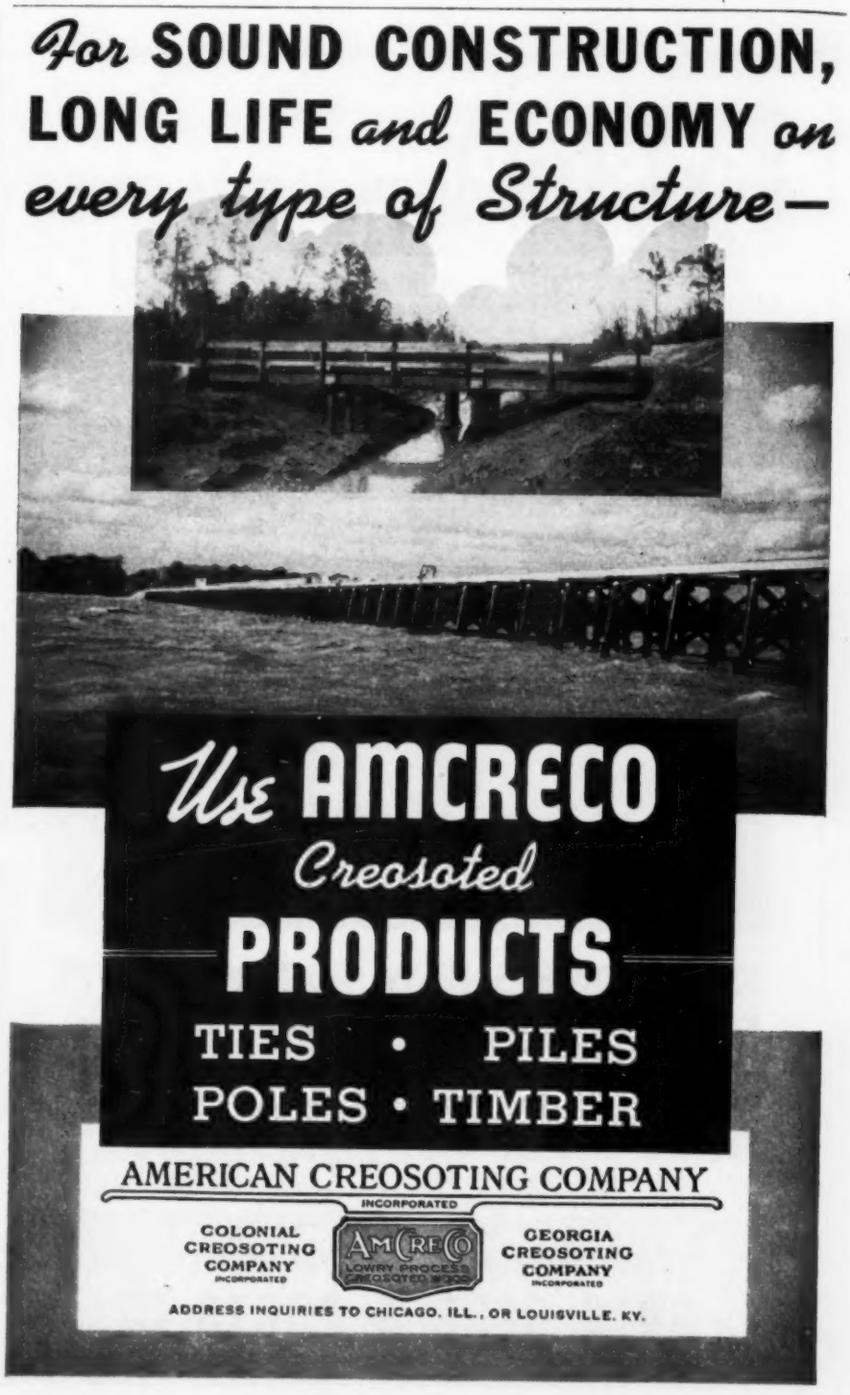
Announcement has been made by the Society of Automotive Engineers that A. W. Herrington has been chosen to guide the efforts of that important organization during the first year of America's active participation in the war. He is the head of the Marmon-Herrington Co., Indianapolis, Ind., manufacturers of highly specialized automotive equipment for difficult civilian and military services. He is also chairman of the board of directors of the Merz Engineering Co., a Marmon-Herrington subsidiary, specializing in the manufacture of precision gauges, instruments and machines.

## New Office Created by Chicago Pneumatic

The appointment of J. Rogers Davis as "Supervisor of Branches" — newly created office of the Chicago Pneumatic Tool Co., has been announced by H. Arnold Jackson, president of the company, at its headquarters, 6 East 44th St., New York. Mr. Davis joined the company in December and will assist in the sales activities of Chicago Pneumatic's 21 District and Sub-district offices. He will standardize sales office procedure and coordinate sales plans and quotas with branch and division managers. Mr. Davis' many years experience with a large equipment manufacturer make him well qualified to fill this new post. Among his various activities, he was an office manager in Philadelphia—later, operating from New York, he systematized operations of all branch offices and warehouses for an entire organization. An industrial engineer, he also has had broad experience in the preparation of catalogs and sales manuals. While at present making an extensive tour of Chicago Pneumatic branches, Mr. Davis will make his headquarters at the company head office, 6 East 44th St., New York. He officially assumed his new duties as "supervisor of branches" on Jan. 1, 1942.

## R. M. Marberry Appointed Advertising Manager for Timken-Detroit

R. M. Marberry, sales promotion manager of the Timken Silent Automatic Division, has been appointed advertising manager of The Timken-Detroit Axle Company. In his new capacity, Mr. Marberry will direct all advertising for Timken axles and brakes, and for Timken Silent Automatic oil heating products.



For SOUND CONSTRUCTION, LONG LIFE and ECONOMY on every type of Structure—
Use AMCRECO Creosoted PRODUCTS
TIES • PILES
POLES • TIMBER
AMERICAN CREOSOTING COMPANY
INCORPORATED
COLONIAL CREOSOTING COMPANY INCORPORATED
AMCRECO LOWRY PROCESS CREOSOTED WOOD
GEORGIA CREOSOTING COMPANY INCORPORATED
ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.

### J. B. Hayden Made Vice-President Industrial Brownhoist

The board of directors of Industrial Brownhoist Corporation has announced the election of James B. Hayden vice-president in charge of sales.

### Kingsbury Now Sales Promotion Manager of Davey Compressor

G. G. Kingsbury of the Davey Compressor Co., Kent, O., has taken over the additional duties of sales promotion manager. Mr. Kingsbury's office will also serve as a clearing house for the exchange of priority information and its relation to dealer sales. Mr. Kingsbury has had extensive experience over a period of 20 years in the sale of contractors' equipment and in dealership contacts.

### Wellman Engineering Co. Opens New Chicago Office

The Wellman Enginering Co., Cleveland, O., has changed the location of its Chicago office to Room 1112, Merchandise Mart, 222 West North Bank Drive. John E. Carlson of the Williams Bucket Division of Wellman is in charge of Williams clamshell and dragline bucket sales and service at this branch office.

### Keystone Asphalt Products Co. Issues Newsletter

Keystone Asphalt Products Co., celebrated its first anniversary in February with the launching of "Keystone Comments," a monthly newsletter of sales and engineering information on the company's building and construction products. The first issue reviews progress made by the company in its first year, predicts further plant expansion during 1942, and discusses use of the company's asphalt mastic board as a blackout sheathing. While issued primarily for dealers and their salesmen, "Keystone Comments" gives information of interest to architects, engineers and contractors. Requests to receive it regularly should be addressed to the company at 43 E. Ohio St., Chicago.

### New Licenses for Skip-Pipe

Dimmick & Mosher Products Co., 120 Boylston St., Boston, Mass., has granted licenses to manufacture skip-pipe to the following companies: Clay City Pipe Co., Uhrichsville, O., and The Romig Clay Products Co., Uhrichsville, O.

### Tyson Building Addition to Its Plant

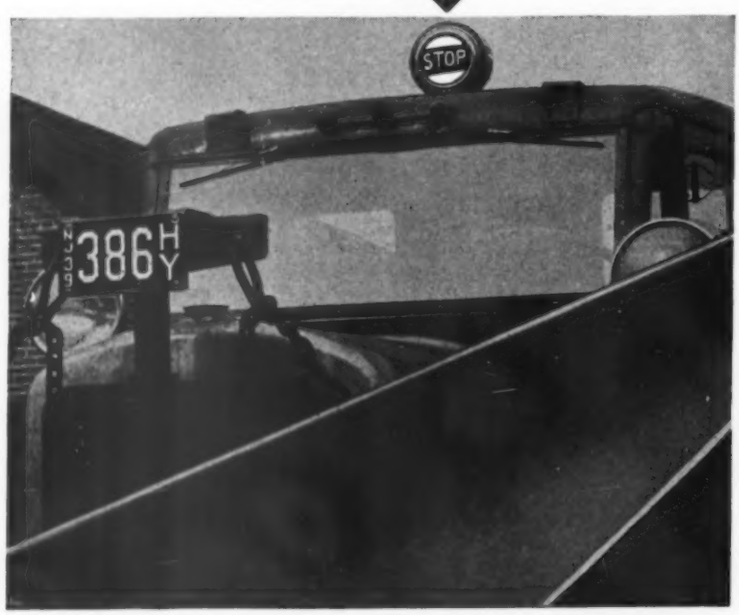
Ground has been broken for a large new addition to the Tyson Roller Bearing Corporation, Massillon, O., manufacturers of tapered roller bearings. The expansion program will cost a third of a million dollars. The new building, an extension of the present plant, is a unit of President Roosevelt's victory program, for Tyson is making an all-out effort for war production. It has been making cageless tapered roller bearings for army and navy ordnance for the past seven years, and in addition manufactures a number of airplane engine parts. During the past two years the corporation's plant facilities have been doubled, and erection of the new building will further materially increase production. Under full-speed construction, it is anticipated the addition will be completed by April 1st.

### Sauerman in New Offices

Sauerman Bros., Inc., is now located in its new offices at 522 South Clinton St., Chicago, Ill. This is the third time in 32 years of business the company has moved. An open house was held at the offices on Jan. 23.


Say STOP and they'll really STOP!

THIS WAY




KEYSTONE SNOW PLOW LIGHTS

For Safer Snow-Fighting and Cindering

In one season, Keystone Snow Plow Lights can repay their modest cost by cutting down accidents and lawsuits. Many Highway Departments now use these lights to throw a powerful, flashing danger signal from the snow plow or cindering truck to all traffic, front and rear. Made of heavy gauge, lead-coated steel to withstand vibration and rust. Heavy, 6½-inch lenses. A sturdy, weatherproof light especially built and designed for snow plows. Furnished in Red and Amber stop—Red, Amber and Blue Plain Lenses. Write at once for full details and quantity prices.

AUTO GEAR & PARTS CO.

1410 W. Hunting Park Ave. Philadelphia, Pa.

### W. H. Klett Joins Marmon-Herrington Co.

Marmon-Herrington Co., Indianapolis, Ind., has recently added to its export staff, in direct charge of Latin American business, William H. Klett, who has had many years experience with the Spanish speaking peoples. Mr. Klett, though a native-born American, was educated in Mexico and did not really learn the English language until he returned to the United States as a young man. His automotive experience comprises the management of a large distributing firm in Mexico City and many years as district manager in Central and South America, as well as in the United States, for several prominent automobile manufacturers.

W. H. Klett

### E. M. Bell, Jr., Vice-President and Treasurer of the Cleveland Tractor Co. Dies

Edward M. Bell, Jr., Vice-President and Treasurer of The Cleveland Tractor Co., died on Jan. 15, 1942, at Fort Lauderdale, Fla. Mr. Bell was born in Clarion, Penn., and was graduated from Penn State College in 1924. He was associated with the Sayre Steel Construction Co. of New York City for several years, where he held the position of secretary and treasurer. Coming to The Cleveland Tractor Co. in 1932, Mr. Bell was elected assistant treasurer in 1935 and vice-president in 1939, the position he held at the time of his death. Survivors are his wife, Mrs. E. M. Bell, Jr., a daughter, Molly, and a son, Edward M. Bell III; his parents, Mr. and Mrs. E. M. Bell of Clarion, Penn.; and two sisters, Mrs. J. V. Mills of Baskingridge, N. J., and Mrs. L. G. Best of Sheffield, Penn.

### Missouri-Illinois Tractor & Equipment Co., Inc., Appointed Bucyrus-Erie Distributors

The Missouri-Illinois Tractor & Equipment Co., Inc., of 510 Withers Ave., St. Louis, Mo., has been appointed distributor for Bucyrus-Erie ⅜-yard to 2½-yard shovels, draglines, clamshell and lifting cranes. Their territory includes southwestern Illinois which covers the counties of Hancock, Adams, Brown, Pike, Calhoun, Madison, Bond, St. Clair, Clinton, Washington, Monroe, Randolph, Perry, Jackson, Union, Alexander, and Pulaski. Eastern Missouri is also included in the new distributor's territory and includes that portion of the state east of, and including, the counties of Scotland, Knox, Shelby, Monroe, Audrain, Callaway, Osage, Maries, Phelps, Texas, and Howell. This organization is also a distributor of Bucyrus-Erie tractor equipment.

### Dr. Rassweiler Made Vice-President Johns-Manville

Dr. C. F. Rassweiler, who joined Johns-Manville last June as director of research, has been appointed a vice-president of Johns-Manville Corporation. In his new office, Dr. Rassweiler will continue in charge of the company's research and development activities which are now largely devoted to converting the full production capacity of Johns-Manville to war uses. Intensive studies of new products and entirely new business possibilities for J-M which may be introduced to create additional employment and sales after the war is over, are also being conducted. Johns-Manville's research laboratories are located in Manville, N. J., and are managed by E. R. Williams, who will continue in that capacity.


Parmanco
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# New Trade Literature

*Laminated Shims.*—An interesting new 8-page booklet which gives a history of the development of industrial and mechanical applications of the laminated shim since the founding of the company, has just been issued by Laminated Shim Co., Inc., Glenbrook, Conn. The book describes the use of the shim for fitting of machine parts in original assembly, as well as for making service adjustments.

*Tournacrane Application.*—R. G. Le Tourneau, Inc., Peoria, Ill., has issued a new 4-page bulletin on the Tournacrane, a high-speed lifting tool for construction and industrial use. The booklet shows the Tournacrane on numerous applications around factory yards, industrial plants, building construction and earth-moving work. Complete information on lifting capacity and speed are given.

*Right of Way Drainage.*—A booklet has been issued by Young & Greenawalt, East Chicago, Ind., on their system of corrugated metal culvert drainage. Case studies of various jobs with interesting illustrations are included, with a description of procedure and practice.

*Bulk Handling Conveyors.*—A 16-page catalog dealing with Rex bulk handling conveyors has been issued by the Chain-Belt Co., Milwaukee, Wis. Information and pictorial descriptions are given of belt conveyors, apron conveyors and bucket elevators.

*Air Raid Shelters.*—"Air Raid Shelters" is the title of an 8-page circular recently published by the Armco Drainage Products Association. It pictures and describes a corrugated pipe shelter made to accommodate up to 50 persons, the maximum recommended by the Office of Civilian Defense. The principal type is of 90-in. Multi Plate pipe, such as is used for large culverts, bridges and sewers, and its length is in multiples of 2½ ft. It has gas-tight end walls and a gas lock or chamber can be included during installation or later. An emergency escape tunnel and ventilar opening are in the rear. An entrance wall or barricade can be provided. An "economy" type of shelter is also provided for individual families. These shelters are not designed to withstand direct hits but the first type described offers protection against gas and demolition bombs falling not closer than 25 ft. Their design is based on similar structures subjected to extensive bombing tests by the War Department. Copies of the circular may be obtained by addressing the Armco Drainage Products Association, Middletown, O.

*Traffic Overpass.*—A 4-page booklet describing the Tournapass, latest product development of R. G. Le Tourneau, Inc., Peoria, Ill., has been released for general distribution. The Tournapass is a portable, low-cost overpass, designed to eliminate traffic congestion at busy intersections. Photographs, actual time studies and car counts taken at a recent demonstration and trial period are featured in the booklet. Also, transportation, assembly and construction are explained.

*Truck Calendar Has Useful Table.*—Federal Motor Truck Co.'s new calendar has two utility features that make a strong bid for the attention and approval of most truck operators, fleet owners and truck transport users. For in addition to its decorative appeal and daily usefulness, the calendar contains a carefully planned time-saving table of weights and measures covering most products car-


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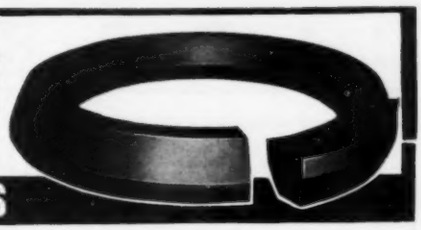

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ried by truck. Another exceptionally valuable contribution to the entire motor transportation industry is Federal's intelligent use of interesting facts and figures dealing with trucks and their fast-growing importance in the fields of military and civilian economy. Anyone desiring one of these useful and attractive truck calendars can obtain a copy without obligation by writing the Advertising Department, Federal Motor Truck Company, Detroit, Mich.

*Shovel, Dragline, Crane.* — The Link-Belt Speeder LS-60 heavy-duty ½-yd. crawler shovel, dragline, crane is covered by a new 8-page illustrated book No. 1929, published by Link-Belt Speeder Corporation, 301 West Pershing Road, Chicago, Ill. Illustrations show the machine at work and how it is built. Working ranges, lifting capacities, clearance dimensions and other pertinent data are given for shovel, dragline, crane, clamshell and trench hoe operation.

*Pipes and Arches.*—Two attractive and useful pieces of trade literature have been issued recently by the Armco Drainage Products Assn., Middletown, Ohio. One deals with the Armco pipe arches; the other with Armco Multiplate pipe and arches. Both are profusely illustrated and explain the use of these products in drainage structures. Both pamphlets have a reference data section containing much useful information on drainage and allied subjects.

*Air Brushes.*—Catalog No. 80, a 32-page, 8½ x 11 booklet, has just been issued by the Eclipse Air Brush Co., 400 Park Ave., Newark, N. J. It covers their complete line of spray equipment for both manual and automatic operation, in addition to their Pneumix air motored agitators for all mixing jobs in batches up to 200 gal.

*Grade Crossings.* — Grade crossings made of laminated panels of pressure-creosoted wood are described in a leaflet (Form G-3) just issued by the Wood Preserving Division of Koppers Co., Pittsburgh, Pa. It shows the advantages of such grade crossings, service results and construction and installation details.

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PAVER, 18E Koehring (½ yd.) on full crawlers, 20 ft. boom and bucket.
PILE HAMMER, No. 3 Vulcan.
PUMPS, 4" and 6" centrifugal.
SHOVEL-CRANE, Northwest Model 18 (½ yd.)
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SHOVEL ATTACHMENT for Model 4 & 5 Northwest machines.
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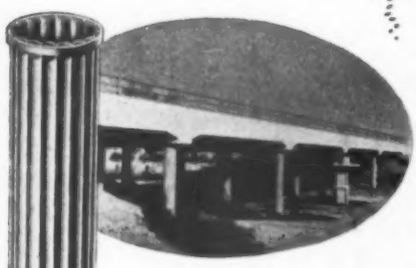

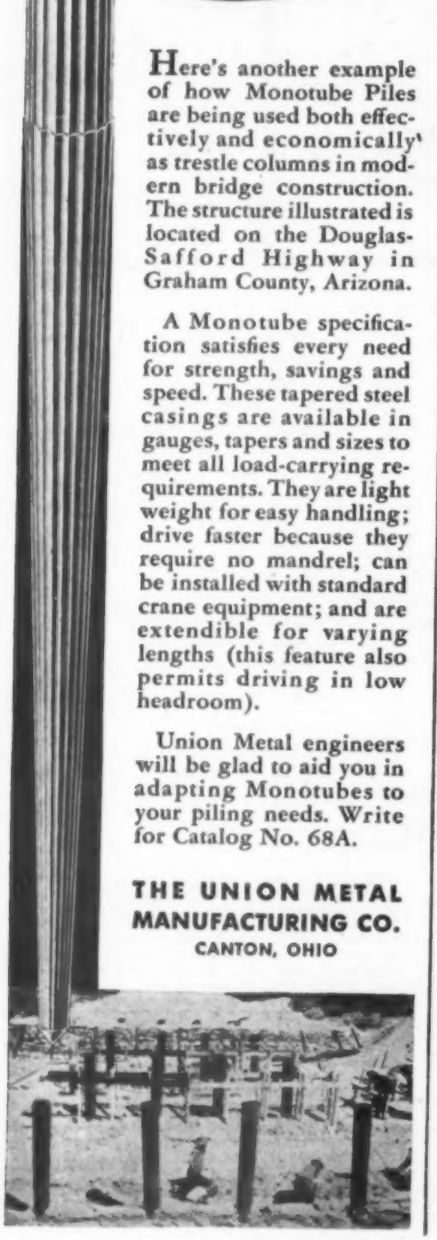

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